OpenBook 1849
Service Guide

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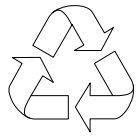

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Revision History

Please refer to the table below for the updates made on OpenBook1849 service guide.

Date	Chapter	Updates

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Conventions

The following conventions are used in this manual:

`Screen messages`	Denotes actual messages that appear on screen.
NOTE	Gives bits and pieces of additional information related to the current topic.
WARNING	Alerts you to any damage that might result from doing or not doing specific actions.
CAUTION	Gives precautionary measures to avoid possible hardware or software problems.
IMPORTANT	Reminds you to do specific actions relevant to the accomplishment of procedures.

Preface

Before using this information and the product it supports, please read the following general information.

1. This Service Guide provides you with all technical information relating to the BASIC CONFIGURATION decided for AOpen "global" product offering. To better fit local market requirements and enhance product competitiveness, your regional office MAY have decided to extend the functionality of a machine (e.g. add-on card, modem, or extra memory capability). These LOCALIZED FEATURES will NOT be covered in this generic service guide. In such cases, please contact your regional offices or the responsible personnel/channel to provide you with further technical details.

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System Specifications

Features

This computer was designed with the user in mind. Here are just a few of its many features:

Performance

- Intel^{R} Pentium^{R} 4 processor
- 512KB System/Video BIOS in flash ROM, shadow RAM support.
- 15” XGA or SXGA LCD.
- nVidia^{R} high-performance graphics chipset with 64MB DDR graphic memory with 8X AGP support.
- Memory upgradable to 1024MB with two PC2100/2700 (266/333MHz DDR) soDIMM slots.
- Power management system
- Dual display capability
- Simultaneous LCD and CRT display

Multimedia

- Audio codec supports stereo at 18-bit ADC/20-bit DAC.
- AC’97 2.3-compliant stereo audio
- SPDIF line-out jack
- Enhanced audio system with two speakers.
- DVD/CD-RW combo drive, CD-ROM or DVD-ROM drive
- S-video output port

Connectivity

- High-speed fax/data software modem
- Onboard PCI 10/100 Mbps LAN.

Human-centric design and ergonomics

- Full-sized keyboard
- Ergonomically-centered touchpad pointing device.
- Launch keys

Expansion

- Upgradeable memory
- USB 2.0 (Universal Serial Bus) ports and IEEE 1394
- Secure digital (SD)/ Memory Stick/ Multi Media Card (MMC) 3-in-1 slot

I/O ports

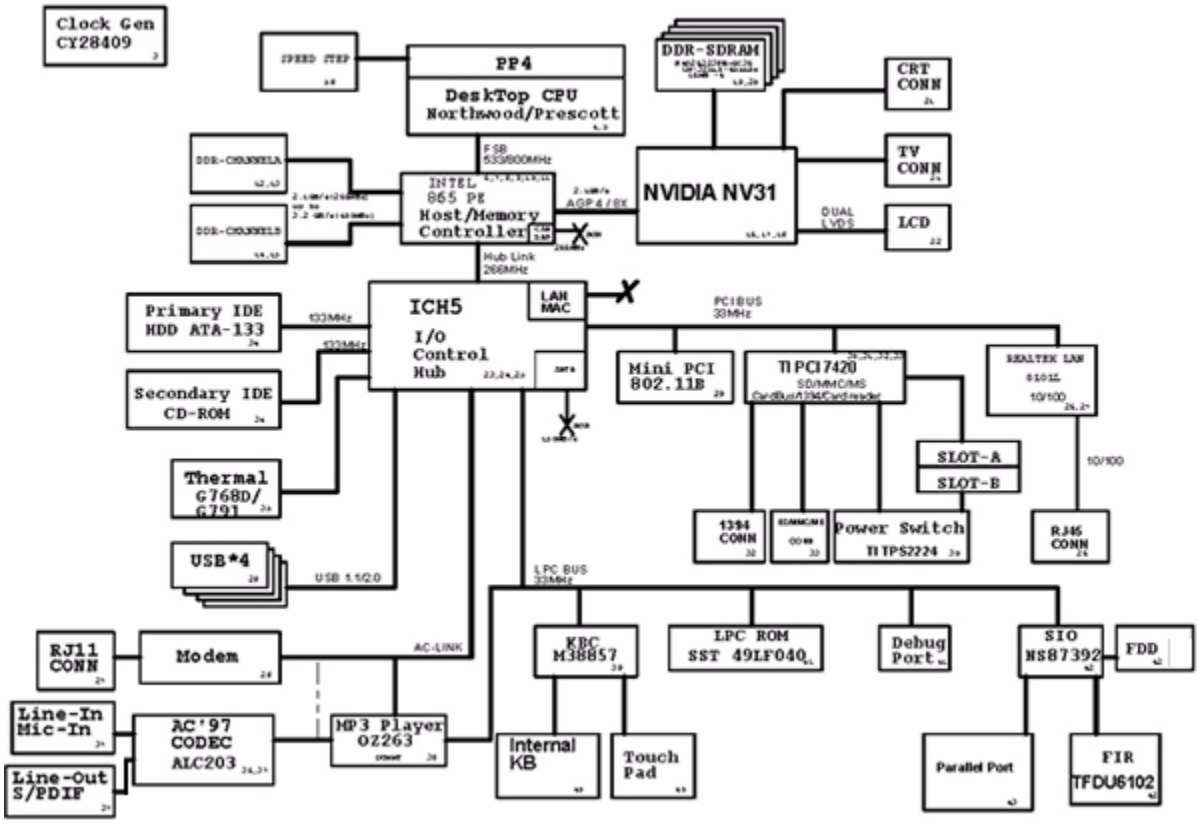
- Two type II Cardbus PC Card slot (3.3V and 5V support)
- One RJ-11 phone jack (V.92)
- One RJ-45 network jack (Ethernet 10/100)
- One DC-in jack
- One external monitor port (DDC 2.0)
- One parallel port
- One audio line-out jack (SPDIF) (3.5mm mini-jack)
- One audio line-in jack (3.5mm mini-jack)
- Four USB 2.0 ports
- One IEEE 1394 port

- One S-video output port
- Secure Digital (SD)/ Memory Stick/ Multi Media Card 3-in 1 slot.
- One Fast Infrared port

System

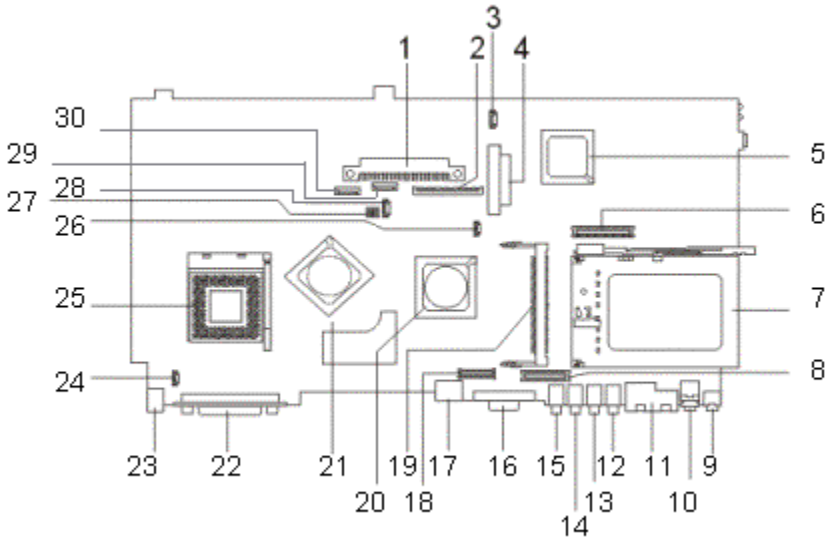
- Microsoft windows XP Home and Professional operating system

System Block Diagram



Board Layout

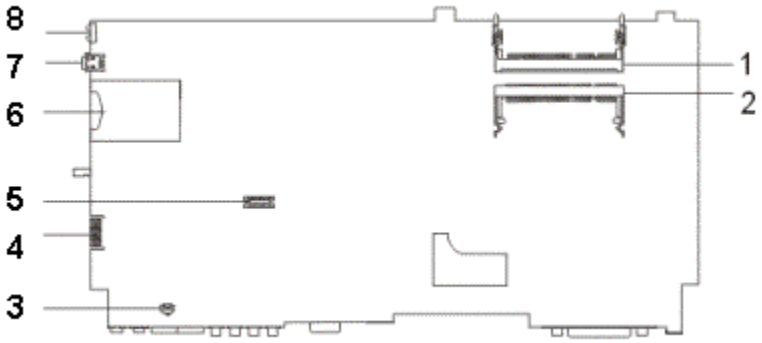
Top View



PCB 02219-1

1	Hard Diskette Drive connector	16	External monitor port
2	Keyboard connector	17	TV-out connector
3	Speaker cable connector	18	LCD coaxial cable connector
4	Optical drive connector	19	Mini-PCI connector
5	South Bridge (Intel FW82801EB)	20	VGA chip (nVIDIA)
6	Launch board cable connector	21	North Bridge (Intel 865PE)
7	PCMCIA cardbus connector	22	Parallel port
8	Inverter cable connector	23	AC adapter connector
9	Line-in connector	24	Lid cover switch cable connector
10	Line-out connector	25	CPU socket
11	Modem port (right) Network port (left)	26	RTC battery connector
12	USB port	27	SW1 Setting*
13	USB port	28	CPU fan connector
14	USB port	29	touch pad cable connector
15	USB port	30	Second CPU fan connector

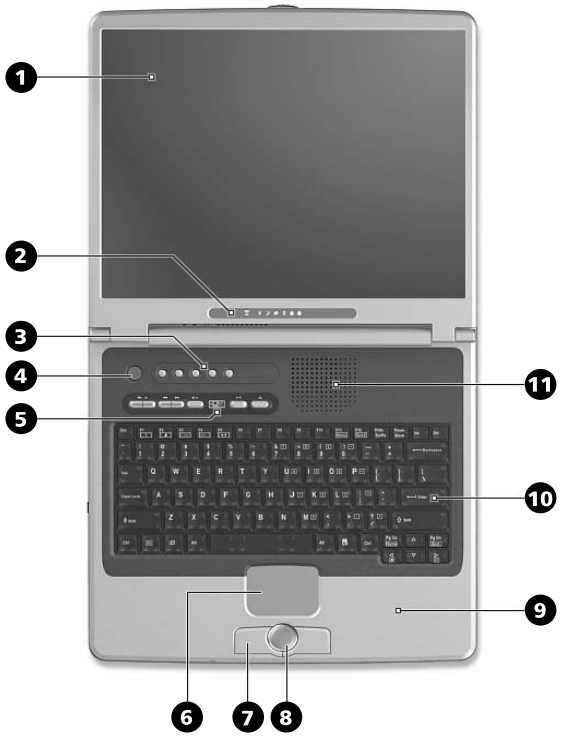
Bottom View



1	Memory socket 2	6	SD/MS/ MMC 3-in-1 slot
2	Memory socket 1	7	1394 connector
3	Modem cable connector	8	FIR
4	Golden Finer (Debug Board)		
5	Modem connector		

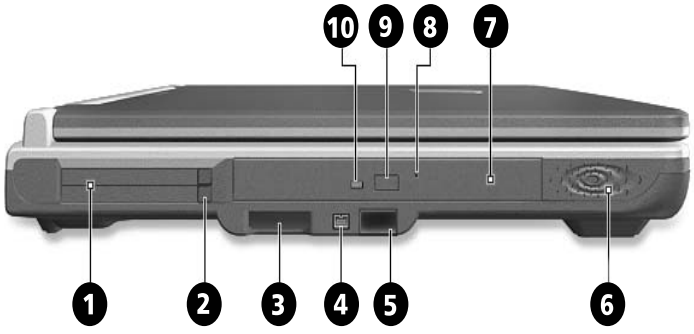
Outlook View

Top View



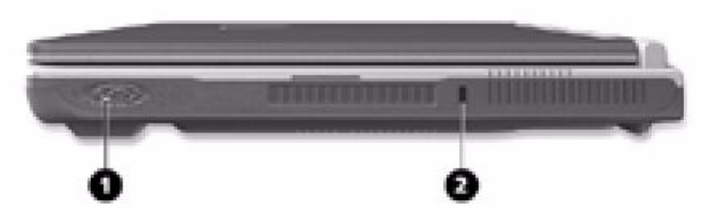
Number	Item	Description
1	Display screen	Also called LCD (liquid-crystal display), displays computer output.
2	Status indicators	LEDs (light-emitting diode) that turn on and off to show the status of the computer, its functions and components.
3	Launch keys	Buttons for launching frequently-used programs.
4	Power button	Turns on the computer power.
5	A V control panel	AV (audio/video) control panel for playing CDs, VCDs, DVDs, and MP3s.
6	Touchpad	Touch-sensitive pointing device which functions like a computer mouse.
7	Click buttons (left, right, and center)	The left and right buttons function like the left and right mouse buttons.
8	4-way scroll key	This button mimics your cursor pressing on the vertical and horizontal scroll bars of Windows application.
9	Palm rest	Comfortable support area for your hands when you use the computer.
10	Keyboard	Inputs data into your computer.
11	Fan slots	Help keep the computer cool. Do not cover these slots which promote proper airflow to the computer.

Left Panel



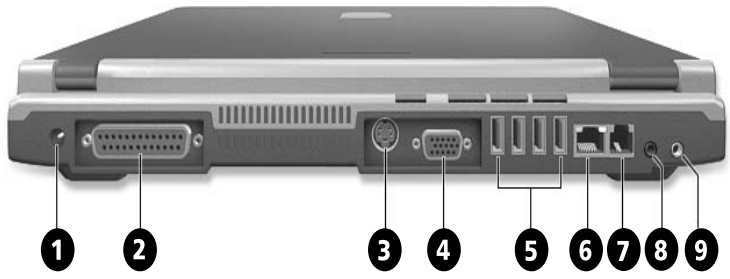
Number	Item	Description
1	PC card slot	Accepts two TypeII/I or one Type III CardBus PC card.
2	PC card eject button	Ejects the PC card from its slot.
3	3-in-1 slot media slot	Accepts any of the following flash memory cards; Secure Digital (SD), Memory Stick, MultiMedia Card (MMC).
4	IEEE 1394	Connects to an IEEE 1394-compatible device (e.g., digital video camera).
5	Infrared port	Interfaces with infrared devices (e.g., infrared printer, IR-aware computer).
6	Speaker	Outputs sound
7	Optical drive	Internal optical drive (CD, DVD, or DVD/ CD-RW combo drive).
8	Emergency eject slot	Ejects the optical drive tray when the computer is turned off.
9	Eject button	Ejects the CD/DVD tray.
10	Optical drive activity indicator	Lights up when the optical drive is active.

Right Panel



Number	Item	Description
1	Speaker	Outputs sound.
2	Security keylock	Connects to a Kensington-compatible computer security lock.

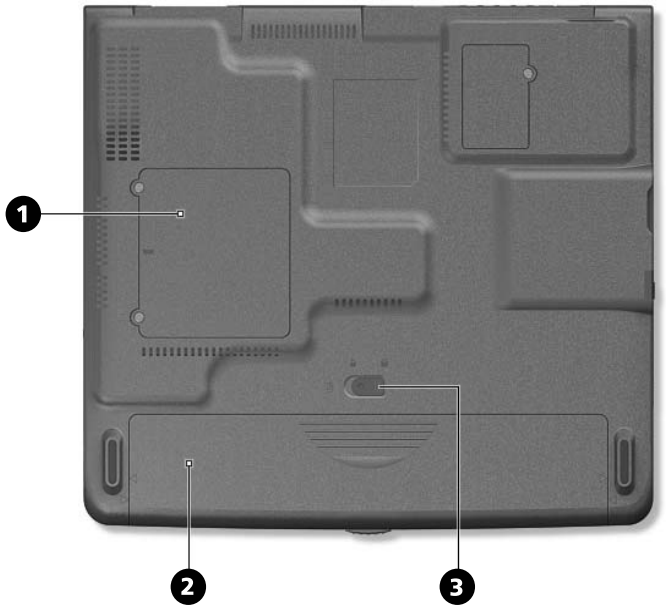
Rear Panel



Number	Item	Description
1	DC-in jack	Connects to an AC adapter.
2	Parallel port	Connects to a parallel device (e.g., parallel printer).
3	S-video out port	Connects to a television or display device with S-video input.
4	External monitor port	Connects to a display monitor (up to 2048x1536 resolution).
5	USB (2.0) ports (four)	Connects to USB devices (e.g., USB digital camera).
6	Network jack	Connects to an Ethernet 10/100-based network.
7	Modem jack	Connects a phone line (only for models with an internal fax/data modem).
8	S/PDIF line-out jack	Connects to audio line-out devices (e.g., speakers, headphones); supports S/PDIF connection.

Number	Item	Description
9	Line-in jack	Accepts audio line-in devices (e.g., audio CD player, stereo walkman)

Bottom Panel



Number	Item	Description
1	Memory compartment cover	Houses the computer's main memory.
2	Battery pack	Supplies power to the computer.
3	Battery release latch	Unlatches the battery to remove it.

Indicators

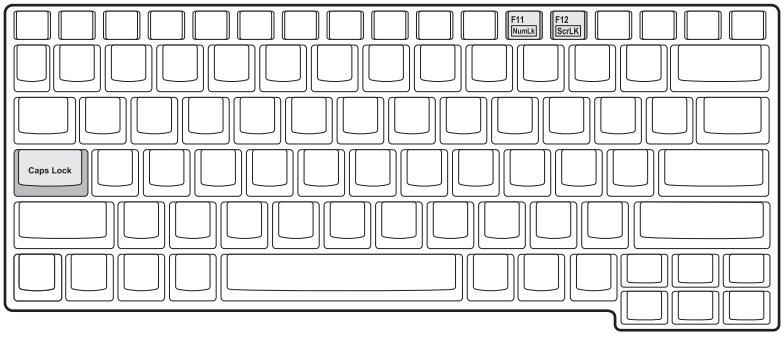
The computer has seven easy-to-read status icons on the bottom of the display screen.

The Power, Sleep status and Wireless Communication icons are visible even when you close the display cover so you can see the status of the computer while the cover is closed.

Number	Icon	Function	Description
1		Wireless Communication	Lights when the Wireless LAN capability (optional) is enabled.
2		Power	Lights when the computer is on. Blinks when a battery-low condition occurs.
3		Sleep	Blinks when computer enters Hibernation mode. Lights when computer enters Standby mode.
4		Media Activity	Lights when the hard disk or Media drive is active.
5		Battery Charge	Lights when the battery is being charged.
6		Caps Lock	Lights when Caps Lock is activated.
7		Num Lock (Fn+F11)	Lights when Num Lock is activated.

Lock Keys

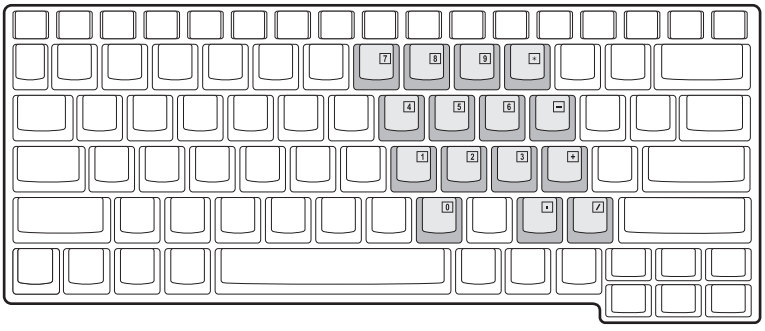
The keyboard has three lock keys which you can toggle on and off.



Lock Key	Description
Caps Lock	When Caps Lock is on, all alphabetic characters typed are in uppercase.
Num Lock (Fn-F11)	When Num Lock is on, the embedded keypad is in numeric mode. The keys function as a calculator (complete with the arithmetic operators +, -, *, and /). Use this mode when you need to do a lot of numeric data entry. A better solution would be to connect an external keypad.
Scroll Lock (Fn-F12)	When Scroll Lock is on, the screen moves one line up or down when you press the up or down arrow keys respectively. Scroll Lock does not work with some applications.

Embedded Numeric Keypad

The embedded numeric keypad functions like a desktop numeric keypad. It is indicated by small characters located on the upper right corner of the key caps. To simplify the keyboard legend, cursor-control key symbols are not printed on the keys.

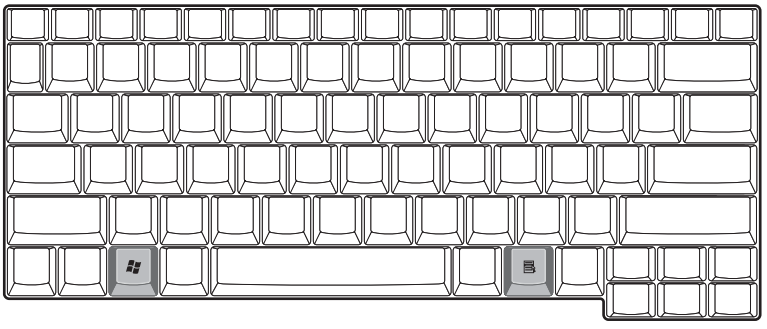


Desired Access	Num Lock On	Num Lock Off
Number keys on embedded keypad	Type numbers in a normal manner.	
Cursor-control keys on embedded keypad	Hold Shift while using cursor-control keys.	Hold Fn while using cursor-control keys.
Main keyboard keys	Hold Fn while typing letters on embedded keypad.	Type the letters in a normal manner.

NOTE: If an external keyboard or keypad is connected to the computer, the Num Lock feature automatically shifts from the internal keyboard to the external keyboard or keypad.

Windows Keys

The keyboard has two keys that perform Windows-specific functions.

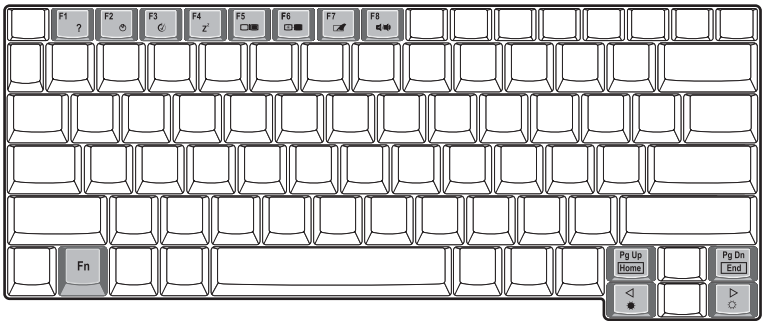


Key	Icon	Description
Windows logo key		Start button. Combinations with this key perform shortcut functions. Below are a few examples: Windows + Tab (Activates next task bar button) Windows + E (Explores My Computer) Windows + F (Finds Document) Windows + M (Minimizes All) Shift + Windows + M (Undoes Minimize All) Windows + R (Displays the Run...dialog box)
Application key		Opens the application's context menu (same as a right-click).

Hot Keys

The computer employs hot keys or key combinations to access most of the computer's controls like screen contrast and brightness, volume output and the BIOS Utility.

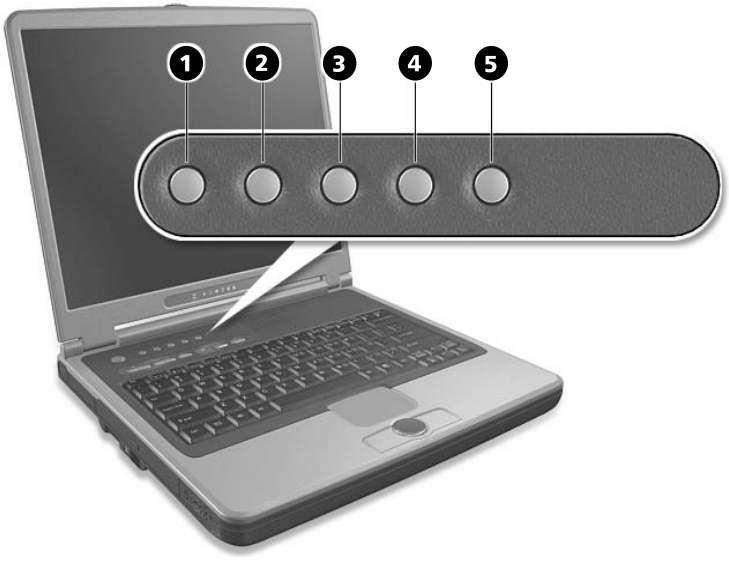
To activate hot keys, press and hold the **Fn** key before pressing the other key in the hot key combination.



Hot Key	Icon	Function	Description
Fn-F1	?	Hot key help	Displays a list of the hotkeys and their functions.
Fn-F2		Sleep	Puts the computer in Sleep mode, which can be defined via the advanced section of the Power Management Properties in the Windows Control Panel.
Fn-F3		Display toggle	Switches display output between the display screen, external monitor (if connected) and both the display screen and external monitor.
Fn-F4		Screen blank	Turns the display screen backlight off to save power. Press any key to return.
Fn-F5		Speaker on/off	Turns the speakers on and off; mutes the sound.
Fn-PgUP	HOME	Home	Functions as the "Home" key.
Fn-PgDn	END	End	Functions as the "End" key.
Fn-→		Brightness up	Increases the screen brightness.
Fn-←		Brightness down	Decreases the screen brightness.

Launch Keys

Located on the left of the keyboard are five buttons. These buttons are called launch keys. They are designated as Wireless Communication, E-mail, Internet Browser, P1 and P2 buttons.



Number	Icon	Function	Description
1		E-mail	The mail button is used to launch the E-mail application.
2		Internet browser	By default, is used to launch your Internet browser.
3		TV out	Automatically switches the display to output on a television that is connected to the s-video port.
4		Resolution	Launches the resolution setting.
5		Wireless communication	This button is used to enable or disable the wireless LAN (optional) function.

AV Control Panel

The AV control panel is a special feature of this computer. Through this AV control panel, you can play most of your audio/video CDs, DVDs, MP3s, and MP3 files on your hard disk.

When the operating system is not running, you can play music CDs and MP3 files on your hard disk. You must first set up the playlist in the Playlist Editor before you can play the MP3 files and CDs. You can set up more than one playlist in your hard disk.

#	Item	Description
1	Volume down	Decrease the volume of the speakers.
2	Volume up	Increase the volume of the speakers.
3	Previous track button ◀◀	Jumps to the previous track in the playlist. When viewing DVD or VCD movies, let you jump to the previous chapter.
4	Next track button ▶▶	Jumps to the previous track in the playlist. When viewing DVD or VCD movies, let you jump to the next chapter.
5	Stop/ Eject/ Media select button	Stops playback, eject the CD or selects the media source. Press once to stop the music being played, press again to enter the media select mode. Press it a third time to display the track number. Up to a maximum of 9 playlists on the hard disk are supported, P1 to P9. For audio CD, D1 is the displayed media source.
6	AV LCD panel	Displays current media status.
7	Play/ Pause ▶/II	Plays and pauses the media playback.
8	AV power button CD POWER	Turns on or off the power of the AV control panel. When this button is turned on, then enter the MP3 player mode. When turned off, then exit the MP3 player mode.

Hardware Specifications and Configurations

Processor

Item	Specification
CPU type	Intel^{R} Pentium 4 (Northwood 2.4/2.6/2.8/3.0/3.2 GHz, Prescott 3.2/3.4/3.6 GHz)
CPU package	P478 package 478 pin FC-PGA 2
CPU core voltage	1.5V
CPU I/O voltage	1.2V

BIOS

Item	Specification
BIOS vendor	Phoenix
BIOS Version	R01-AXX
BIOS ROM type	LPC Flash
BIOS ROM size	512KB
BIOS package	PLCC 32-pin
Supported protocols	ACPI 1.0b/2.0, HDD password, INT 15h Extensions, Boot Block, DTMF Desktop Management Interface Specification V2.0, WfM 2.0 (for build in Ethernet Model), PCMCIA V3.0 Compliant Device, SM BIOS 2.3, IEEE 1394 V1.0, PCI 2.2, PnP BIOS 1.0a, USB Specification 1.1/2.0, CD-ROM Boot Specification V1.0, Simple Boot Flag
BIOS password control	Supervisor Password, User Password, Password on Boot available.

Second Level Cache

Item	Specification
Cache controller	Built-in CPU
Cache size	512KB / 1MB on die
1st level cache control	Always enabled
2st level cache control	Always enabled
Cache scheme control	Fixed in write-back

System Memory

Item	Specification
Memory controller	Intel 865 PE
Onboard memory size	512KB system / video BIOS in flash ROM
DIMM socket number	2 sockets (2 banks)
Supports memory size per socket	256MB, 512MB
Supports maximum memory size	1024MB
Supports DIMM type	DDR
Supports DIMM Speed	266/ 333 MHz
Supports DIMM voltage	2.5V
Supports DIMM package	200-pin soDIMM
Memory module combinations	You can install memory modules in any combinations as long as they match the above specifications.

LAN Interface

Item	Specification
Chipset	Realtek 8101L
Supports LAN protocol	10/100 Mbps
LAN connector type	RJ45
LAN connector location	Rear side

Modem Interface

Item	Specification
Chipset	Askey 1456VQL4A
Fax modem data baud rate (bps)	14.4K
Data modem data baud rate (bps)	56K
Supports modem protocol	V.92 MDC
Modem connector type	RJ11
Modem connector location	Rear side

Hard Disk Drive Interface

Item	Specification	
Vendor & Model Name	Hitachi 40G IC25N040ATMR04	Hitachi 80G IC25N080ATMR04
Capacity (MB)	40G	80G
Bytes per sector	512	512
Data heads	2	4
Recording zone	16	16
Drive Format		
Disks	1	2
Spindle speed (RPM)	4200 RPM	4200 RPM
Performance Specifications		
Buffer size	2048 KB - Upper 308 KB is used for firmware	8192 KB - Upper 308 KB is used for firmware
Interface	ATA/ATAPI-6 (E-IDE)	ATA/ATAPI-6 (E-IDE)
Max. media transfer rate (disk-buffer, Mbytes/s)	350 TYP	350 TYP
Data transfer rate (host~buffer, Mbytes/s)	100 MB/Sec. (Ultra DMA 100)	100 MB/Sec. (Ultra DMA 100)
DC Power Requirements		
Voltage tolerance	5V(DC) +/- 5%	5V(DC) +/- 5%

DVD-ROM Interface

Item	Specification	
Vendor & model name	MKE SR-8177 W/K3	
Performance Specification	With CD Diskette	With DVD Diskette

DVD-ROM Interface

Item	Specification	
Transfer rate (KB/sec)	Average Sustained: CAV mode 775~1800 blocks/sec (10.3X to 24X) 1550~3600kBytes/sec (Mode 1) 1768~4106 kBytes/sec (Mode 2)	DVD-5: Normal Speed (1X) 11.08 Mbits/sec CAV mode 36.67~88.64 Mbits/sec DVD-9/DVD-R/DVD-RW: Normal Speed (1X) 11.08 Mbits/sec CAV mode 36.67~88.64 Mbits/sec
Average Full Access time (typ.)	CD: (Disc: MNSU-005) Random (*1) CAV mode 95 msec typical 125 msec average max Full Stroke (*2) CAV mode 200 msec typical 260 msec average max 1/3 Stroke (*3) CAV mode 105 msec typical 135 msec average max	DVD-5:(Disc: MKE-D551) Random (*4) 120 msec typical 160 msec average max Full Stroke (*5) 270 msec typical 350 msec average max 1/3 Stroke (*6) 130 msec typical 170 msec average max DVD-9: (Disc: ODSC-PARA) Random (*7) 150 msec typical 200 msec average max Full Stroke (*8) 340 msec typical 450 msec average max 1/3 Stroke (*9) 170 msec typical 220 msec average max DVD-RAM (2.6G) (Disc: LM-DB26) Random (*10) 200 msec typical 300 msec average max Full Stroke (*11) 300 msec typical 600 msec average max Full Stroke (*12) 220 msec typical 320 msec average max DVD-RAM (4.7G) (Disc: LM-HB47J) Random (*13) 180 msec typical 300 msec average max Full Stroke (*14) 320 msec typical 700 msec average max Full Stroke (*15) 240 msec typical 350 msec average max
Data Buffer Capacity	256 kBytes	
Interface	IDE	
Applicable disc format	DVD: DVD-5, DVD-9, DVD-10, DVD-18, DVD-R (3.95G/4.7G), DVD-RAM (2.6G/4.7G), DVD-RW CD: CD-Audio, CD-ROM (mode 1 and mode 2), CD-ROM XA (mode 2, form 1 and form 2), CD-I (mode 2, form 1 and form 2), CD-I Ready, CD-I Bridge, CD-WO, CD-RW, Photo CD, Video CD, Enhanced Music CD, CD-TEXT	
Loading mechanism	Soft eject (with emergency eject hole)	
Power Requirement		

DVD-ROM Interface

Item	Specification
Input Voltage	+5V[DC]+/-5%

(*1) Average of Data read over the whole area from 00 min. 02 sec. 00 block to 59 min. 58 sec. 74 block more than 2000 times including latency and layered error correction time.
(*2) From 00 min. 02 sec. 00 block to 59 min. 58 sec. 74 block including latency and layered error correction time.
(*3) From 00 min. 02 sec. 00 block to 20 min 00 sec. 00 block including latency and layered error correction time.
(*4) Average of Data read over the whole area from starting data recorded area (LBA:0) to maximum data recorded area (LBA:23197F), more than 2000 times including latency and layered error correction time.
(*5) From starting data recorded area (LBA:0) to maximum data recorded area (LBA:23197F) including latency and layered error correction time.
(*6) From starting data recorded area (LBA:0) to maximum data recorded area (LBA:86A29) including latency and layered error correction time.
(*7) Average of Data read over the whole area from starting data recorded area (LBA:0) to maximum data recorded area (LBA:3FA0DF), more than 2000 times including latency and layered error correction time.
(*8) From starting data recorded area (LBA:0) to maximum data recorded area (LBA:3FA0DF) including latency and layered error correction time.
(*9) From starting data recorded area (LBA:0) to maximum data recorded area (LBA:277D8E) including latency and layered error correction time.

DVD + RW Interface

Item	Specification
Vendor & Model name	Ricoh / RW8160A
Performance Specification	
Transfer rate (MB/sec)	CD Read: 4X, 8X, 12X, 16X, 20X, 24X Write: 4X, 8X, 16X (CD-R) 4X, 8X (CD-RW) DVD Read: 2X, 2.4X, 5X, 8X(DVD-ROM only) Write: 2.4X
Speed	<Read> 4X: 0.6MB/sec. 8X: 1.2MB/sec. 12X: 1.8MB/sec. 16X: 2.4MB/sec. 20X: 3.0MB/sec. *1 24X: 3.6MB/sec. *1 <Write> CD-R 4X: 0.6MB/sec. 8X: 1.2MB/sec. 16X: 2.4MB/sec. CD-RW 4X: 0.6MB/sec. 8X: 1.2MB/sec. DVD+RW and DVD+R 2.4X: 3.31MB/sec. <DVD Read> 2X: 2.77MB/sec. 2.4X: 3.31MB/sec. 5X: 4.16MB/sec. 8X: 11.08MB/sec.

DVD + RW Interface

Item	Specification
Access time (typ.)	Ave. 160msec. (CD), Ave. 180msec. (DVD)
Buffer memory	8MB
Applicable disc format	CD-DA, CD-ROM, CD-ROM XA, CD-I, Video-CD, Photo-CD, CD-Text, CD extra.
MTBF (Life)	60,000 Hours
Loading mechanism	Drawer with soft eject and emergency eject hole
Power Requirement	
Input voltage	5V(DC) +/- 5%

Audio Interface

Item	Specification
Audio Controller	Realtek ALC 203 AC97 Codec
Audio onboard or optional	Built-in
Mono or Stereo	Stereo
Resolution	20 bit stereo Digital to analog converter 18 bit stereo Analog to Digital converter
Compatibility	Microsoft DC97/PC2001, AC97 2.2
Mixed sound source	PC speaker, phone line, mic, line-in, CD-in
Voice channel	5/6-bit, mono/stereo
Sampling rate	96 KHz
Internal microphone	Yes
Internal speaker / Quantity	Yes
Supports PnP DMA channel	Not available
Supports PnP IRQ	Not available

Video Interface

Item	Specification
Chip vendor and model name	nVIDIA NV34 Ultra 64MB
Chip voltage	Core/1.45V Memory/2.5V
Supports ZV (Zoomed Video) port	No
Graph interface	8X AGP (Accelerated Graphics Port) bus
Maximum resolution (LCD)	15.0” TFT XGA, 1024x768x262144 color
Maximum resolution (CRT& LCD)	800x600x256 colors
Maximum resolution (CRT)	1024X768x16M colors, refresh rate up to 85Hz or higher

Video Memory

Item	Specification
Fixed or upgradeable	Fixed, shared with system BIOS
Video memory size	512KB

Video Resolutions Mode

Resolution	8 bits (256 colors)	16 bits (High color)	32 bits (True color)
640x480	Yes	Yes	Yes
800x600	Yes	Yes	Yes
1024x768 (15.0” TFT XGA)	Yes	Yes	Yes
1024x768 (External CRT))	Yes	Yes	No

Parallel Port

Item	Specification
Parallel port controller	NS SIO PC87392
Number of parallel port	1
Location	Rear side
Connector type	25-pin D-type connector, in female type
Parallel port function control	Enable/Disable by BIOS Setup
Supports ECP/EPP	Yes (set by BIOS setup)
Optional ECP DMA channel (in BIOS Setup)	Not available
Optional parallel port I/O address (in BIOS Setup)	378, 278, 3BC
Optional parallel port IRQ (in BIOS Setup)	IRQ7, IRQ5

USB Port

Item	Specification
USB Compliancy Level	1.1/ 2.0
OHCI	1.1/ 2.0
Number of USB port	4
Location	Rear side
USB port function control	Enable/Disable by BIOS Setup

IrDA Port

Item	Specification
IrDA FIR port controller	NS SIO PC87392
Number of IrDA FIR port	1
Location	Left side
IrDA FIR port function control	Enable/Disable by BIOS Setup
IrDA FIR port (in BIOS Setup)	3F8, 2FB, 3EB, 2EB
IrDA FIR port IRQ (in BIOS Setup)	IRQ3
ECP DMA channel (in BIOS Setup)	Not available
Optional IrDA FIR port DRQ (in BIOS Setup)	Not available

PCMCIA Port

Item	Specification
PCMCIA controller	TI PCI7420
Supports card type	Type-II
Number of slots	Two Type -II
Access location	Left side
Supports ZV (Zoomed Video) port	No ZV support
Supports 32 bit CardBus	Yes (IRQ4, IRQ5)

System Board Major Chips

Item	Controller
System core logic	Intel 865PE Intel ICH5
Super I/O controller	NS PC87392
Audio controller	Realtek ALC 203
Video controller	nVIDIA NV34
Hard disk drive controller	Intel ICH5
Keyboard controller	Mitsubishi M38857
RTC	Intel ICH5

Keyboard

Item	Specification
Keyboard controller	Mitsubishi M38857
Keyboard vendor & model name	Sunrex K020830A1/UI US
Total number of keypads	84/85/88 international language key (10 languages)
Windows 95 keys	Yes
Internal & external keyboard work simultaneously	Yes

Battery

Item	Specification	
Vendor & model name	Sony LIPX048	SMP
Battery Type	Li-Ion	
Pack capacity	4400 mAH	6000 mAH
Number of battery cell	12	12
Package voltage	14.8 V	14.8V

DC-AC LCD Inverter

Item	Specification
Vendor & model name	Ambit T62I194.12
Input Characteristics	
Input voltage (VDC)	6.5~21V
Input current (ADC)	1A(Max)
Input power (W)	4.9W(Max)
On/Off control (Input voltage) (VDC)	-0.3~0.8V(Min.)
Brightness_1 (PWM control)	3.3V(Typ)
Brightness_2 (VDC)	0~3.0V
Output Characteristics	
Output Current (mA)	0~1.2mA 0.6mA(Typ)
Output Current (mA)	5.5~6.5mA 6.0mA(Typ)
Frequency (KHz)	40(Min.)
Kickoff voltage (VACrms)	1500(Min.)
Burst mode frequency (Hz)	260~290
Efficiency (%)	80(Min.)

NOTE: DC-AC inverter is used to generate very high AC voltage, then support to LCD CCFT backlight user, and is also responsible for the control of LCD brightness. Avoid touching the DC-AC inverter area while the system unit is turned on.

NOTE: There is an EEPROM in the inverter, which stores its supported LCD type and ID code. If you replace a new inverter or replace the LCD with a different brand, use Inverter ID utility to update the ID information.

Item	
Vendor & model name	Sumida TWS-458-031
Input Characteristics	
Input voltage (VDC)	14.4V(Typ.)
Input current (ADC)	135mA(Max) (VADJ=1.6V) 390mA(Max) (VADJ=3.3V)
Output Characteristics	

Item	
Output Current (mA)	VADJ=1.6V: 1.5~2.5 2.0 (Typ.) VADJ=3.3V: 5.0~6.0 5.5 (Typ.)
Frequency (KHz)	VADJ=3.3V: 47~57 52(Typ.)
Kickoff voltage (VACrms)	1500(Min)

LCD

Item	Specification
Vendor & model name	AU B150XG01
Mechanical Specifications	
LCD display area (diagonal, inch)	15
Display technology	TFT
Resolution	XGA (1024x768)
Supports colors	262K
Optical Specification	
Brightness control	Keyboard hotkey
Contrast control	No
Electrical Specification	
Supply voltage for LCD display (V)	3.3

AC Adapter

Item	Specification
Vendor & model name	LSE ADPT 3P 20V 120W LISHIN
Input Requirements	
Maximum input current (A, @90Vac, full load)	2A
Nominal frequency (Hz)	50-60
Frequency variation range (Hz)	47-63
Nominal voltage (Vrms)	100-240
Input voltage range (Vrms)	90-265
Inrush current	100/220A max. at cold-start and 25 degree C, dc output full-loading and 115/230Vac input.
Efficiency	83% min. at dc output full-loading and 115/230Vac input.
Output Ratings	
DC output voltage	20V
Noise + Ripple	Low frequency ripple (< 100KHz) <= 300mVpp, and Total composite Ripple and Noise. Less than 380mVp-p, tested by dc loading side parallel with a 10uF/EC. and 0.1uF/Ceramic. Capacitors and Measured Band Width 20MHz.
Dynamic Output Characteristics	
Hold up time	4ms (@115Vac, Full load)
Over Voltage Protection (OVP)	28V
Short circuit protection	Short circuit protection with auto recovery function.
Electrostatic discharge (ESD)	15KV (at air discharge) 8KV (at contact discharge)
Dielectric Withstand Voltage	
Primary to secondary	1800Vac
Leakage current	0.25 mA max. (@ 254Vac, 50Hz)

AC Adapter

Item	Specification
Regulatory Requirements	Safety Requirements: 1.The subject product rated 100-120V 60Hz must be listed under UL 1950 and certified with SCA Standard C22.2 No.950. 2.The subject product rated 200-240V 50Hz must comply with low voltage directive 73/23EEC. EMI Requirements: 1.The subject product rated 100-120V 60Hz must meet the EMI requirements of FCC part 15, Subpart B for Class B Digital Device and get FCC Certification before marketing into USA and Canada. 2.The subject product rated 200-240V 50Hz must meet the EMC Directive 89/336/EEC. 3.The subject product rated 100-120V must meet the VCCI-2 EMI requirements.

Power Management

Power Saving Mode	Resume
Sleep State Mode Standby state is defined to be one of S3 states. * S3 state: CPU is in “Off” and all devices in power-managed states.)	❑ Resume from Standby state should be instantaneous. ❑ Resume from Standby can be activated via power button.
Hibernation State Mode Hibernate state is defined to be: * System is completely off * System parameters are saved to HDD * File-Based Save To Disk	❑ Resume from Hibernation should be less than 1 minute for 64MB memory

Environmental Requirements

Item	Specification
Temperature	
Operating	+5~+35 °C
Non-operating	-10~+60 °C
Non-operating	-30~+60 °C (storage package)
Humidity	
Operating	20% to 80% RH, non-condensing
Non-operating	20% to 80% RH, non-condensing (unpacked)
Non-operating	20% to 90% RH, non-condensing (storage package)
Vibration	
Operating (unpacked)	2~200Hz: 0.40Grms
Non-operating (unpacked)	2-200Hz: 0.80Grms
Non-operating (packed)	2-200Hz: 1.00Grms
Shock	
Operating	25G/3ms, 10 times each 4 horizontal directions 35G/3ms, 10 times each 2 vertical directions
Non-operating	160G/3ms, 1 time all 6 directions

Mechanical Specification

Item	Specification
Dimensions	326 (W) x 290 (D) x 36.8~38.6 (H) mm for 15.0” TFT
Weight	7.5 lbs for 15.0” TFT model with battery
I/O Por	Two type II Cardbus PC Card slot (3.3V and 5V support). One RJ-11 phone jack (V.92). One RJ-45 network jack (Ethernet 10/100). One DC-in jack. One external monitor port (DDC 2.0). One parallel port. One audio line-out jack (SPDIF) (3.5mm mini-jack). One audio line-in jack (3.5mm mini-jack). Four USB 2.0 ports. One IEEE 1394 port . One S-video output port. Secure Digital (SD)/ Memory Stick/ Multi Media Card 3-in 1 slot. One Fast Infrared port.
Drive Bays	Two
Material	Housing: MCS-050 Panel : Plastic
Indicators	Wireless Communication, Power LED, Sleep LED, Media Activity, Battery Charge, Caps Lock, Num Lock
Switch	Power

Memory Address Map

Memory Address	Size	Function
0x100000	64KB	System BIOS
0xF0000	64KB	UMB Area
0xE0000	128KB	VGA BIOS
0xC0000	128KB	Video memory
0xA0000	640KB	Conventional memory

I/O Address Map

I/O Address	Function
00000000-00000CF7	PCI bus
00000000-0000000F	Direct memory access controller
00000020-00000021	Programmable interrupt controller
00000024-00000025	Motherboard resources
00000028-00000029	Motherboard resources
0000002C-0000002D	Motherboard resources
00000010-0000001F	Motherboard resources
00000030-00000031	Motherboard resources
00000034-00000035	Motherboard resources
00000038-00000039	Motherboard resources
0000003C-0000003D	Motherboard resources
00000040-00000043	System timer
00000050-00000053	System timer
00000060-00000060	Standard 101/102-key or Microsoft natural PS/2 keyboard
00000061-00000061	System Speaker
00000062-00000062	Microsoft ACPI-compliant Embedded controller
00000064-00000064	Standard 101/102-key or Microsoft natural PS/2 keyboard
00000066-00000066	Microsoft ACPI-compliant Embedded controller
00000070-00000071	System CMOS/real time clock
00000072-00000077	Motherboard resources
000000A0-000000A1	Programmable interrupt controller

I/O Address Map

I/O Address	Function
00000090-0000009F	Motherboard resources
000000A4-000000A5	Motherboard resources
000000A8-00000A9	Motherboard resources
000000AC-00000AD	Motherboard resources
000000B0-00000B5	Motherboard resources
000000B8-00000B9	Motherboard resources
000000BC-00000BD	Motherboard resources
000000C0-00000DF	Direct memory access controller
000000F0-00000FF	Numeric Data Processor
00000170-0000177	Secondary IDE channel
000001F0-00001F7	Primary IDE channel
00000274-0000277	ISAPNP Read Data Port
00000279-0000279	ISAPNP Read Data Port
000002F8-00002FF	IrDA fast infrared port
00000376-0000376	Secondary IDE channel
00000378-000037B	Printer port (LPT1)
000003B0-00003BB	NVIDIA GeForce4 FX Go5250
000003B0-00003BB	Intel 82865G\PE\P Processor to AGP Controlleer-2571
000003C0-00003DF	NVIDIA GeForce4 FX Go5250
000003C0-00003DF	Intel 82865G\PE\P Processor to AGP Controlleer-2571
000003F6-00003F6	Primary IDE channel
00000600-000060F	Motherboard resources
000004D0-00004D1	Motherboard resources
00000A79-0000A79	ISAPNP Read Data Port
00000D00-000FFFF	PCI bus
00001000-000107F	Motherboard resources
00001800-000183F	Realtek AC' 97 Audio
00001840-000185F	Intel(R) 82801EB USB Universal Host Controller 24D2
00001860-000187F	Intel(R) 82801EB USB Universal Host Controller 24D4
00001880-000189F	Intel(R) 82801EB USB Universal Host Controller 24D7
000018A0-00018BF	Intel(R) 82801EB USB Universal Host Controller 24DE
000018C0-00018DF	Intel(R) 82801EB SMBUS Controller 24D3
000018E0-00018EF	Intel(R) 82801EB Ultra ATA Storage Controller
00002000-00020FF	Realtek RTL 8139/810x Family Fast Ethernet NIC
0000F900-000F9FF	Generic CardBus Controller
0000FA00-000FAFF	Generic CardBus Controller
0000FC00-000FCFF	Generic CardBus Controller
0000FD00-000FDFF	Generic CardBus Controller
0000FE00-000FE00	Motherboard resources

IRQ Assignment Map

Interrupt Channel	Function
IRQ0	System timer
IRQ1	Keyboard
IRQ3	IR

IRQ Assignment Map

Interrupt Channel	Function
IRQ8	CMOS/ RTC
IRQ9	SCI IRQ used by ACPI bus
IRQ10	Intel(R) 82801EB SMBUS Controller-2403
IRQ16	Intel(R) 82801EB USB Universal Host Controller-24D2
IRQ16	Intel(R) 82801EB USB Universal Host Controller-24DE
IRQ17	Realtek AC'97 Audio
IRQ18	Intel(R) 82801EB USB Universal Host Controller-24D7
IRQ19	Intel(R) 82801EB USB Universal Host Controller-24D4
IRQ19	Realtek RTL 8139/810x Family Fast Ethernet NIC
IRQ20	Generic CardBus Controller
IRQ21	Generic CardBus Controller
IRQ22	TI PCIxx20 Integrated FlashMedia Controller
IRQ23	Standard Enhanced PCI to USB Host Controller
IRQ23	TI OHCI Compliant IEEE1394 Host Controller

DMA Channel Assignment

DMA Channel	Function
DRQ3	IrDA FIR
DRQ4	DMA controller

System Utilities

BIOS Setup Utility

The BIOS Setup Utility is a hardware configuration program built into your computer's BIOS (Basic Input/ Output System).

Your computer is already properly configured and optimized, and you do not need to run this utility. However, if you encounter configuration problems, you may need to run Setup. Please also refer to Chapter 4 Troubleshooting when problem arises.

To activate the BIOS Utility, press F2 during POST

Navigating the BIOS Utility

There are six menu options: System Information, Main System Settings, Advanced, System Security, Boot Options and Exit Setup.

To enter a menu, highlight the item using the ↑ / ↓ keys, then press ENTER .

Within a menu, navigate through the BIOS Utility by following these instructions:

- Press the ↑ / ↓ keys to move between the parameters.
- Press the ← / → keys to change the value of a parameter.

- Press the Esc key while you are in any of the menu options to return to the main menu.

NOTE: You can change the value of a parameter if it is enclosed in square brackets. Navigation keys are shown at the bottom of the screen.

System Information

The System Information screen displays a summary of your computer hardware information.

The items in this screen are important and vital information about your computer. If you experience computer problems and need to contact technical support, this data helps our service personnel know more about your computer.

NOTE: The screen above is a sample and may not reflect the actual data on your computer. “X” may refer to a series of numbers and/or characters.

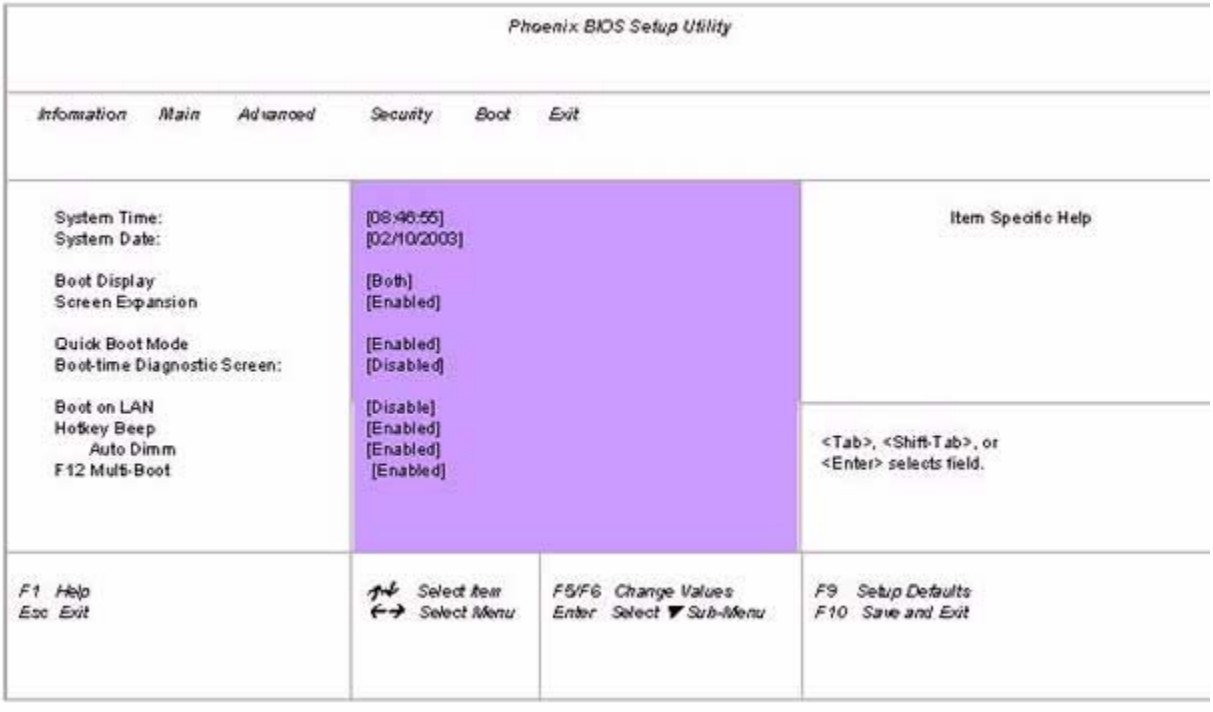
The following table describes the information in this screen.

Parameter	Description
CPU Type	Display the type of CPU.
CPU Speed	Display the speed of CPU.
System Memory	Display the current system memory.
Extended Memory	Display the current extended memory
HDD1 Serial Number	Display the primary master HDD serial number. If no primary master HDD, show ‘None’.
System BIOS Version	The current system BIOS version
VGA BIOS Version	The current VGA BIOS version. It is got from VGA BIOS AX=5F01.
KBC Version	The current KBC version.

Parameter	Description
Serial Number	Display the serial number of the computer. (32 characters)
Asset Tag Number	Display the asset tag number of the computer. (16 characters)
Product Name	Display the Product Name. (15 characters)
Manufacturer Name	Display the manufacturer Name (15 characters)
UUID Number	Display the universally unique identifier of your computer. (16 Byte Hex digital)

Main System Settings

The Main System Settings screen allows you to set the system date and time.



The following table describes the parameters in this screen.

Parameter	Description	Options
System Time	Sets the system time Format: HH:MM:SS (Hour: Minute: Second) *Help:* <Tab>,<Shft-Tab>, or <Enter> selects field.	
System Date	Sets the system date. Format: MM/DD/YYYY (Month/Day/Year) *Help:* <Tab>, <Shift>, or <Enter> selects field.	

Parameter	Description	Options
Boot Display	Set the display output device on boot up. When set to Auto, the computer automatically determines the display device. If an external display device (e.g., monitor) is connected, it becomes the boot display. When set to Both, the computer outputs to both the LCD and the external display if one is connected.	**Auto** Both
Screen Expansion	Expand the display screen on boot up .	**Enabled** Disabled
QuickBoot Mode	Allow the system to skip certain tests while booting. This will decrease the time needed to boot the system.	**Enabled** Disabled
Boot-time Diagnostic Screen	Enable to show the logo screen on boot up.	**Enabled** Disabled
Boot on LAN	When set to enabled, system will boot on LAN. Notice: Need to restart system for enabling Boot-on-LAN function.	**Disabled** Enabled
Hotkey Beep	Enable or disable hotkey beep.	**Enabled** Disabled
Auto Dim	The system will support an automatic dimming of the LCD backlight when the AC power is NOT available (running on battery power).	**Enabled** Disabled
F12 Multi-Boot	Users could choose if to display 'Fn-F12 for multi-boot' message during post	**Enabled** Disabled

Advanced Information

The Advanced Information screen contains parameter values that define how your computer behaves on system startup.

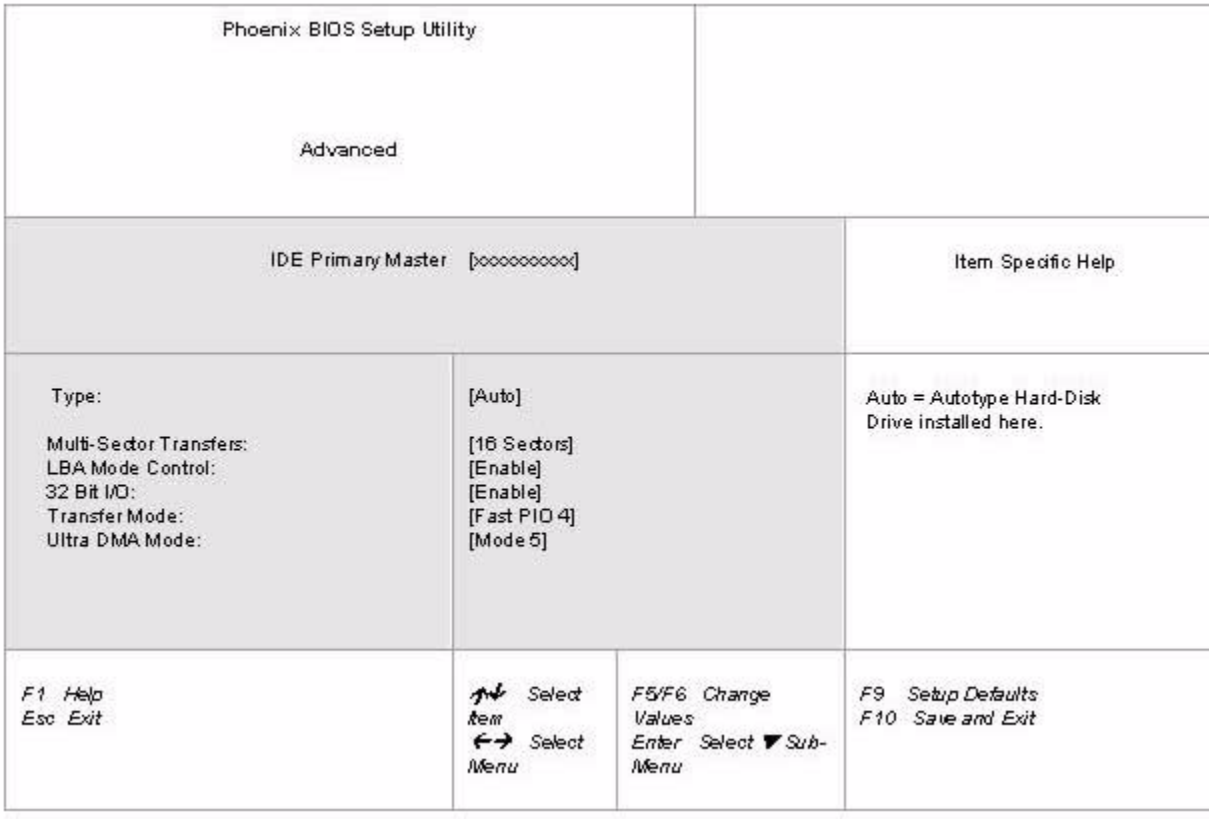
The following table describes the parameters in this screen. Settings in boldface are the default and suggested parameter settings.

Parameter	Description	Options
IDE Primary Master	Show IDE Primary Master device status. User can enter submenu to set some detail functions.	
IDE Secondary Master	Show IDE Secondary Master device status. User can enter submenu to set some detail functions.	
Hyper Threading Technology	Enable 2nd logical processor.	Disabled or Enabled
Onboard Device Configuration	Enter submenu to set onboard device configuration. *Help: Peripheral Configuration*	
Resume on LAN/MODEM Access	Set Enabled or Disabled to wake on LAN/ MODEM access.	**Disabled** or Enabled

Primary Master

The Primary Master sub-menu contains parameters related to the primary hard disk.

CAUTION: The parameters in this screen are for the advanced users only. Typically, you do not need to change the values in this screen. The default setting of **Auto** optimizes all the settings for your hard disk.



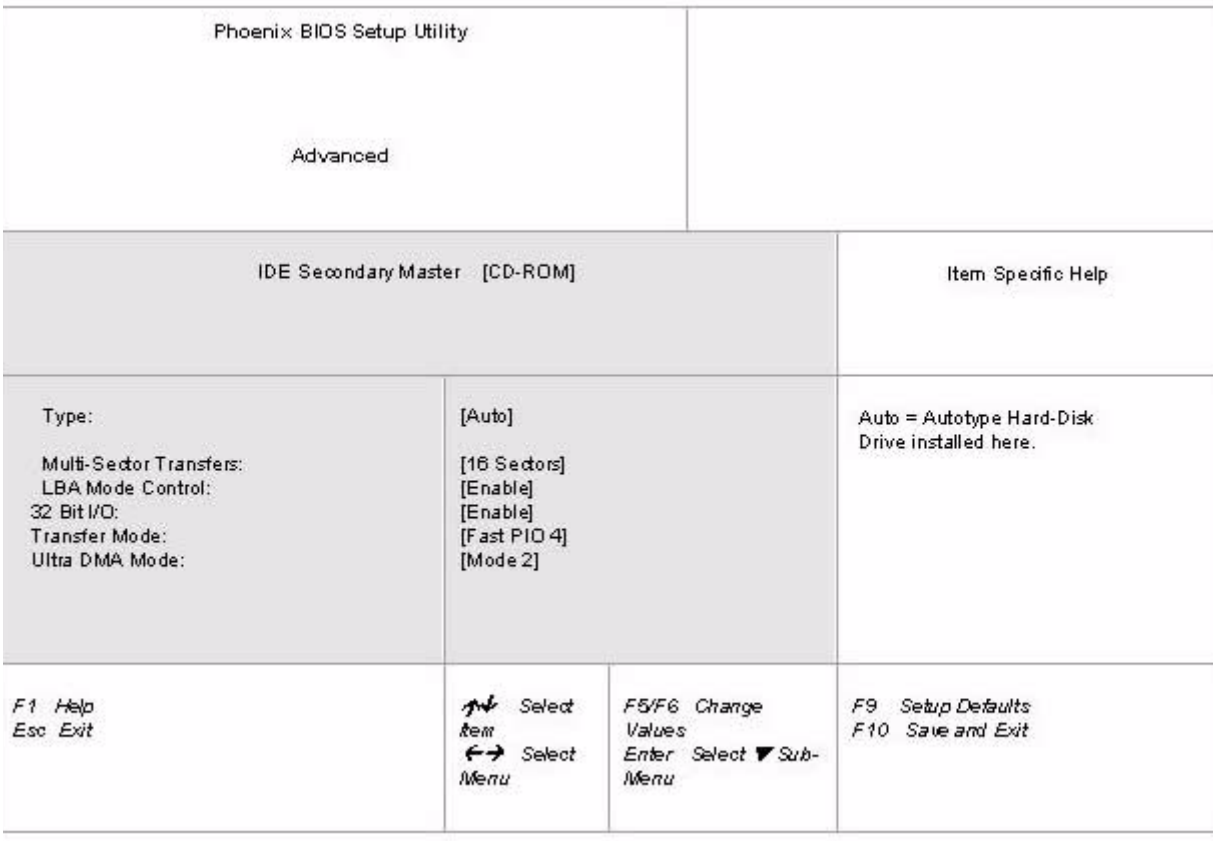
Parameter	Description	Options
Type	The setting of detail functions stands on type *Help:* Auto = Autotype Hard-Disk drive installed here. User = You enter parameters of hard-disk drive installed at this connection. Other ATAPI = another ATAPI device is installed here. IDE Removable = another IDE removable device is installed here. CD-ROM = a CD-ROM drive is installed here. ATAPI Removable = another ATAPI removable device is installed here. None = no device is installed here.	**Auto** User Other ATAPI IDE Removable CD-ROM ATAPI Removable None
Multi-Sector Transfers	Specify the number of sectors per block for multiple sector transfers.	**16 Sectors** Disabled 8 Sectors 4 Sectors 2 Sectors

Parameter	Description	Options
LBA Mode Control	Enabling LBA causes Logical Block Adddressing to be used in place of Cylinders, Heads and Sectors.	**Enabled** Disabled
32 Bit I/O	The setting of 32 bit IDE data transfers .	**Disabled** Enabled
Transfer Mode	Select the method for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.	**Fast PIO 4** FPIO 4/DMA 2 Standard FPIO 3/DMA 1 Fast PIO 3 Fast PIO 2 Fast PIO 1
Ultra DMA Mode	Selects the Ultra DMA mode used for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.	**Disabled** Mode 4 Mode 5 Mode 3 Mode 2 Mode 1 Mode 0

Secondary Master

The Secondary Master sub-menu contains parameters related to the Media bay drive.

CAUTION: The parameters in this screen are for the advanced users only. Typically, you do not need to change the values in this screen. The default setting of Auto optimizes all the settings for your Media bay drive.



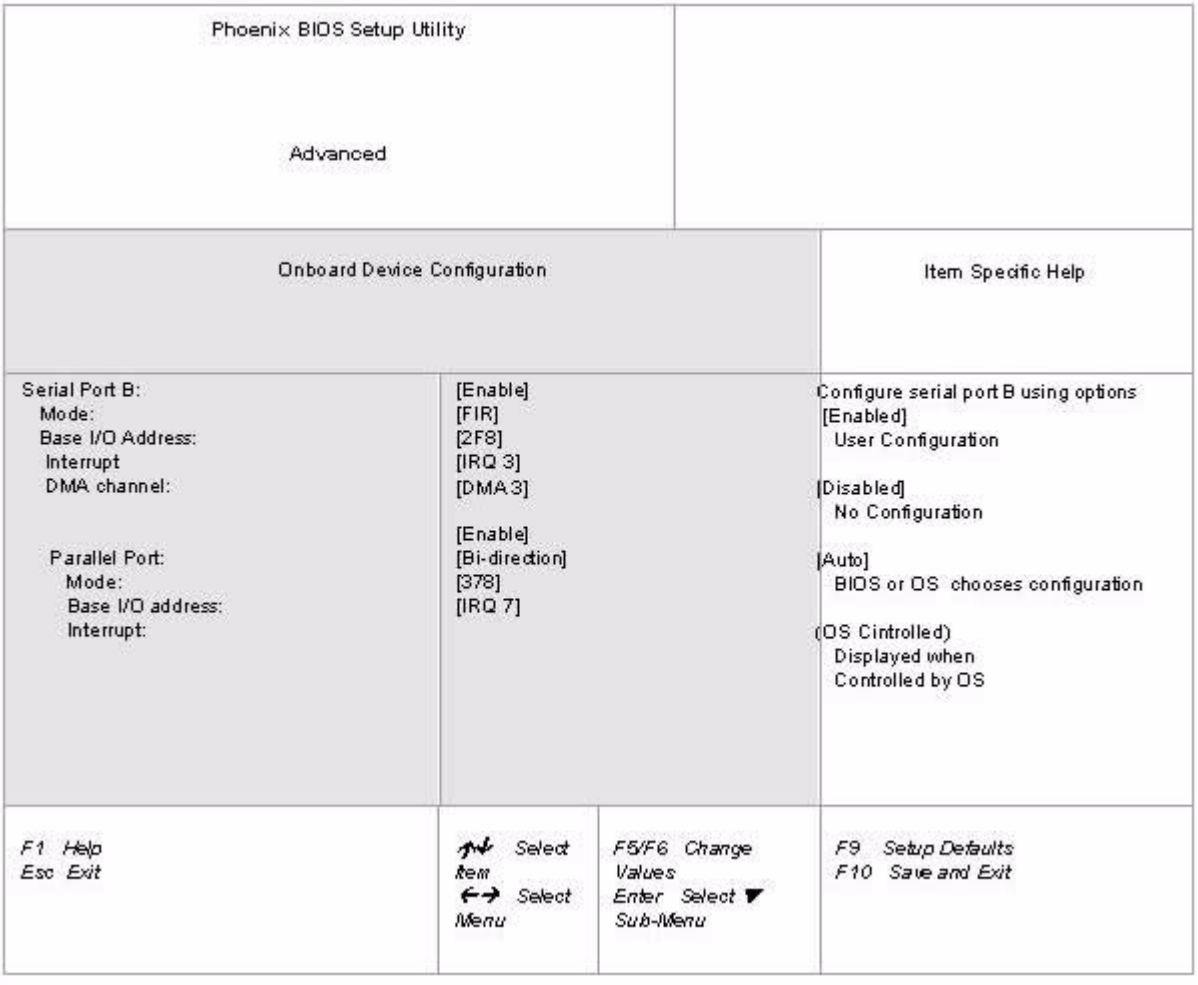
Parameter	Description	Options
Type	The setting of detail functions stands on type *Help:* Auto = Autotype Hard-Disk drive installed here. User = You enter parameters of hard-disk drive installed at this connection. Other ATAPI = another ATAPI device is installed here. IDE Removable = another IDE removable device is installed here. CD-ROM = a CD-ROM drive is installed here. ATAPI Removable = another ATAPI removable device is installed here. None = no device is installed here.	**Auto** User Other ATAPI IDE Removable CD-ROM ATAPI Removable None
Multi-Sector Transfers	Specify the number of sectors per block for multiple sector transfers.	**Disabled** 16 Sectors 8 Sectors 4 Sectors 2 Sectors

Parameter	Description	Options
LBA Mode Control	Enabling LBA causes Logical Block Adddressing to be used in place of Cylinders, Heads and Sectors.	**Disabled** Enabled
32 Bit I/O	The setting of 32 bit IDE data transfers .	**Disabled** Enabled
Transfer Mode	Select the method for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.	**Standard** Fast PIO 4 FPIO 4/DMA 2 FPIO 3/DMA 1 Fast PIO 3 Fast PIO 2 Fast PIO 1
Ultra DMA Mode	Selects the Ultra DMA mode used for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.	**Disabled** Mode 2 Mode 5 Mode 4 Mode 3 Mode 1 Mode 0

Onboard Device Configuration

The parameters in this screen are for advanced users only. You do not need to change the values in this screen because these values are already optimized.

The Onboard Device Configuration screen assigns resources to basic computer communication hardware.



The following table describes the parameters in this screen. Settings in **boldface** are the default and suggested parameter settings.

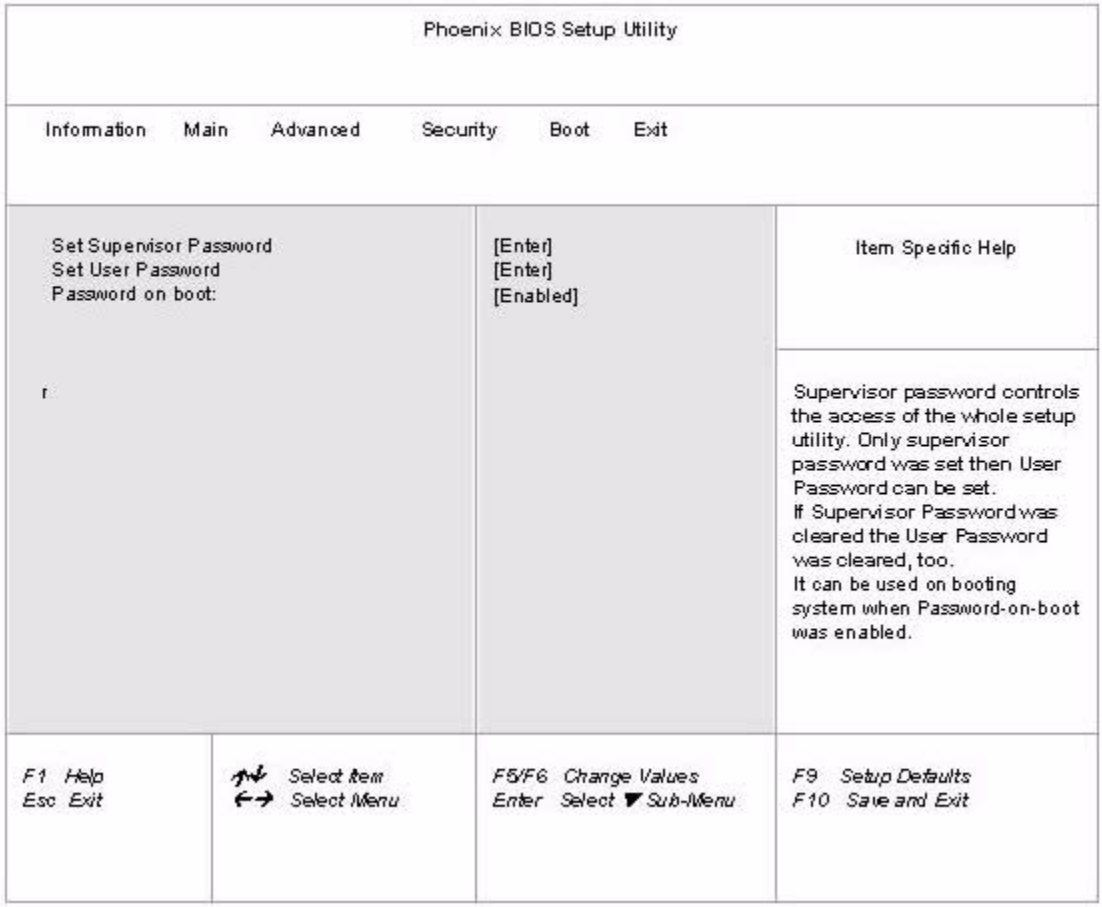
NOTE: When the device is disabled, all the sub-items will be showed as [--].

Parameter	Description	Options
Serial Port B	Enables or disable the serial port. Enabled/Disabled setting won't affect the Windows Device Manager setting of the serial port. Configure Serial Port using options: Disabled: No configuration Enabled: User configuration Auto: BIOS or OS chooses configuration	**Enabled** Disabled
Mode	Set the mode for the parallel port using options. If operation mode is set to ECP DMA channel, sets the direct memory access (DMA) channel for the printer to operate in ECP mode. This parameter is enabled only if operation mode is set to ECP.	**Bi-directional** EPP ECP Output only

Parameter	Description	Options
Base I/O Address	Set the base I/O address for the FIR operation.	**2F8** 3F8 2E8
Interrupt	Set the interrupt for the Com operation.	**IRQ 3** IRQ 4
DMA Channel		**DMA 3** **DMA 1**
Parallel Port	Enables or disable the parallel port. The parallel port is a PnP device. Enabled/Disabled setting won't affect the Windows Device Manager setting of the parallel port. Configure Parallel Port using options: Disabled: No configuration Enabled: User configuration Auto: BIOS or OS chooses configuration	**Enabled** Disabled
Mode	Set the mode for the parallel port using options. If operation mode is set to ECP DMA channel, sets the direct memory access (DMA) channel for the printer to operate in ECP mode. This parameter is enabled only if operation mode is set to ECP.	**Bi-directional** EPP ECP Output only
Base I/O Address	Set the base I/O address for the parallel port.	**378** 278 3BC
Interrupt	Set the interrupt for the parallel port.	**IRQ 7** IRQ 5

System Security

The System Security screen contains parameters that help safeguard and protect your computer from unauthorized use.


Phoenix BIOS Setup Utility
Information Main Advanced Security Boot Exit
Set Supervisor Password
Set User Password
Password on boot:
[Enter]
[Enter]
[Enabled]
Item Specific Help
Supervisor password controls the access of the whole setup utility. Only supervisor password was set then User Password can be set.
If Supervisor Password was cleared the User Password was cleared, too.
It can be used on booting system when Password-on-boot was enabled.
F1 Help
Esc Exit
Select Item
Select Menu
F5/F6 Change Values
Enter Select ▶ Sub-Menu
F9 Setup Defaults
F10 Save and Exit

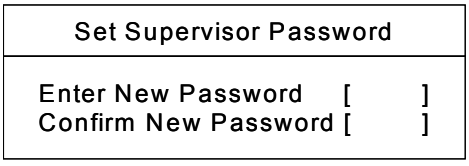
The following table describes the parameters in this screen. Settings in **boldface** are the default and suggested parameter settings.

Parameter	Description	Options
Set Supervisor Password	While entering SETUP, BIOS need to request user to enter supervisor password if set. This password protects the BIOS SETUP menu from unauthorized modification. *Help*: Supervisor Password controls accessing the whole setup utility. It can be used to boot up when Password on boot is enabled.	**Enter**
Set User Password	During POST, BIOS need to check user password if set. This password protects the system from unauthorized user entry before OS boots up. *Help*: User Password controls accessing part of the setup utility. It can be used to boot up when Password on boot is enabled.	**Enter**
Password on boot	Enable or disable password entry on boot up.	**Disabled** Enabled

Setting a Password

Follow these steps:

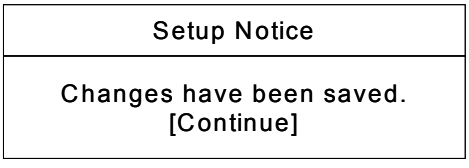
1. Use the cursor ↑/↓ keys to highlight a Password parameter (Supervisor Password, User Password, or Primary Hard Disk Password) and press the ENTER key. The password box appears as below if choosing Set Supervisor Password:



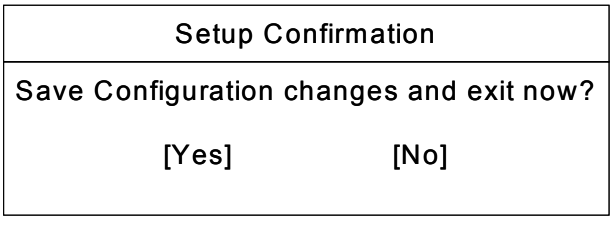
2. Type a password. The password may consist of up to eight characters (A-Z, a-z, 0-9) and then press ENTER .

IMPORTANT: Be very careful when typing your password because the characters do not appear on the screen.

3. Retype password to verify your first entry and then press ENTER . The following screen appears:



4. After setting the password, the computer automatically sets the chosen password parameter to Present.
5. Press ESC to return to the main menu.
6. Press F10. The following dialogue box appears.

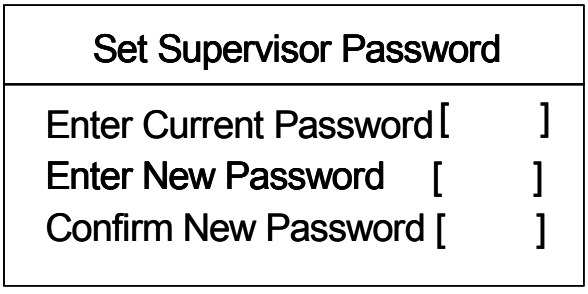


7. Select **Yes** and press ENTER to save the password and exit the BIOS utility.

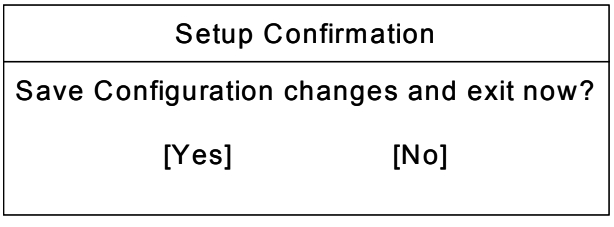
Removing a Password

Should you want to remove a password, do the following:

1. Use the cursor up/ down keys to highlight a password parameter (Setup, User or Hard Disk) and press the ENTER key. The password box appears.



2. Enter the current password and press ENTER .
3. Press ENTER twice without entering anything in the **Enter New Password** field and **Confirm New Password** field to remove the existing password.
4. Press ESC to return to the main menu.
5. Press F10 . The following dialogue box appears.



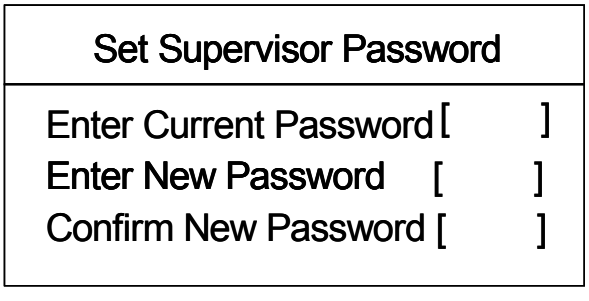
6. Select **Yes** and press ENTER to save the change and exit the BIOS utility.

Changing a Password

To change a password, follow these steps:

Follow these steps:

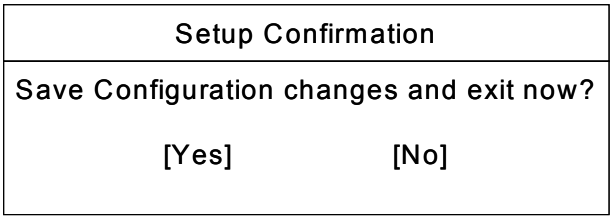
1. Use the cursor ↑ / ↓ keys to highlight the Password parameter (Setup, User or Hard Disk) and press the ENTER key. The password box appears:



2. Enter the current password and press ENTER .
3. Type the new password. The password may consist of up to eight characters (A-Z, a-z, 0-9).

IMPORTANT: Be very careful when typing your password because the characters do not appear on the screen.

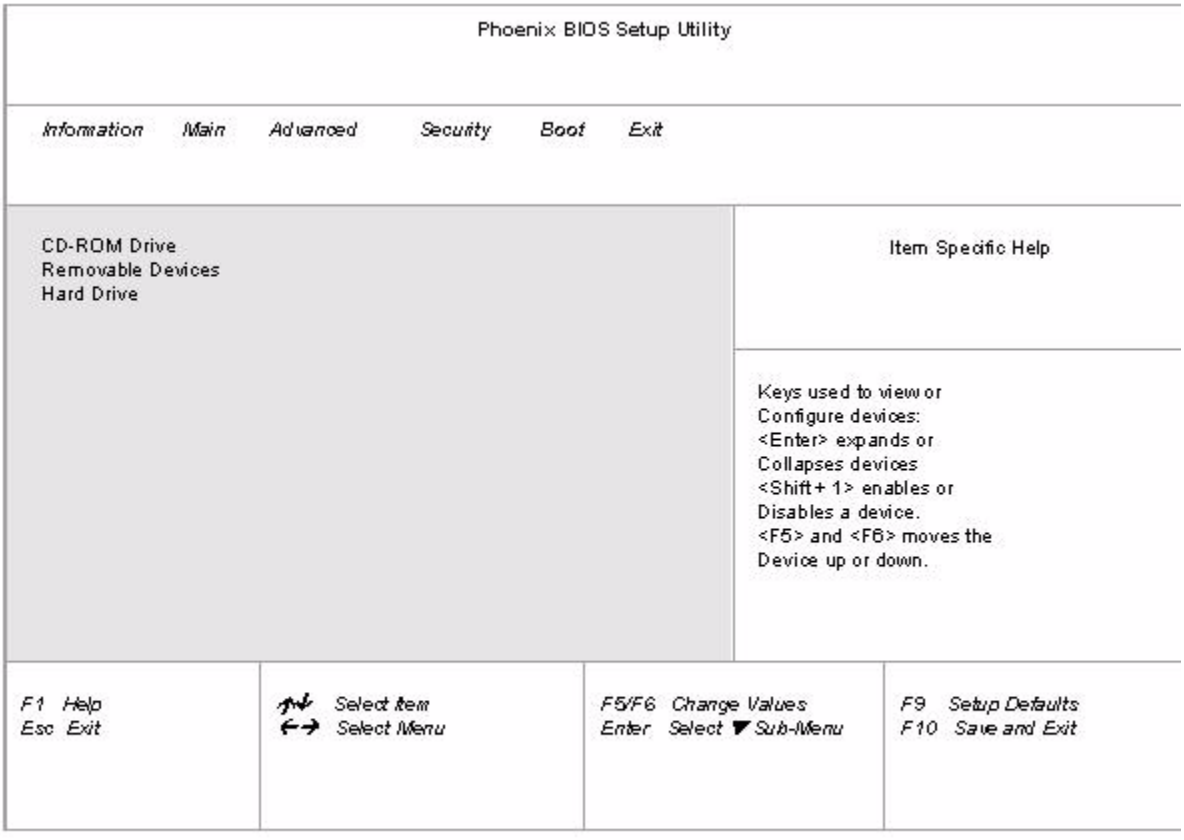
4. Press ENTER . Retype the password to verify your first entry and press ENTER .
5. Press ESC to return to the main menu.
6. Press F10 . The following dialogue box appears.



7. Select **Yes** and press ENTER to save the password and exit the BIOS utility.

Boot Options

Users can press F12 during POST to enter the Boot Options Menu. In this menu users can change boot device without entering BIOS SETUP utility.



NOTE: There are four priorities that can let the user to specify the boot device sequence.

The priority of options from top to bottom is 1st, 2nd, 3rd and 4th.

If the Removable Device or Hard Drive option has multi devices, show '+' in front of option and show each device information.

If Network Boot ROM exists, users can also choose it to boot.

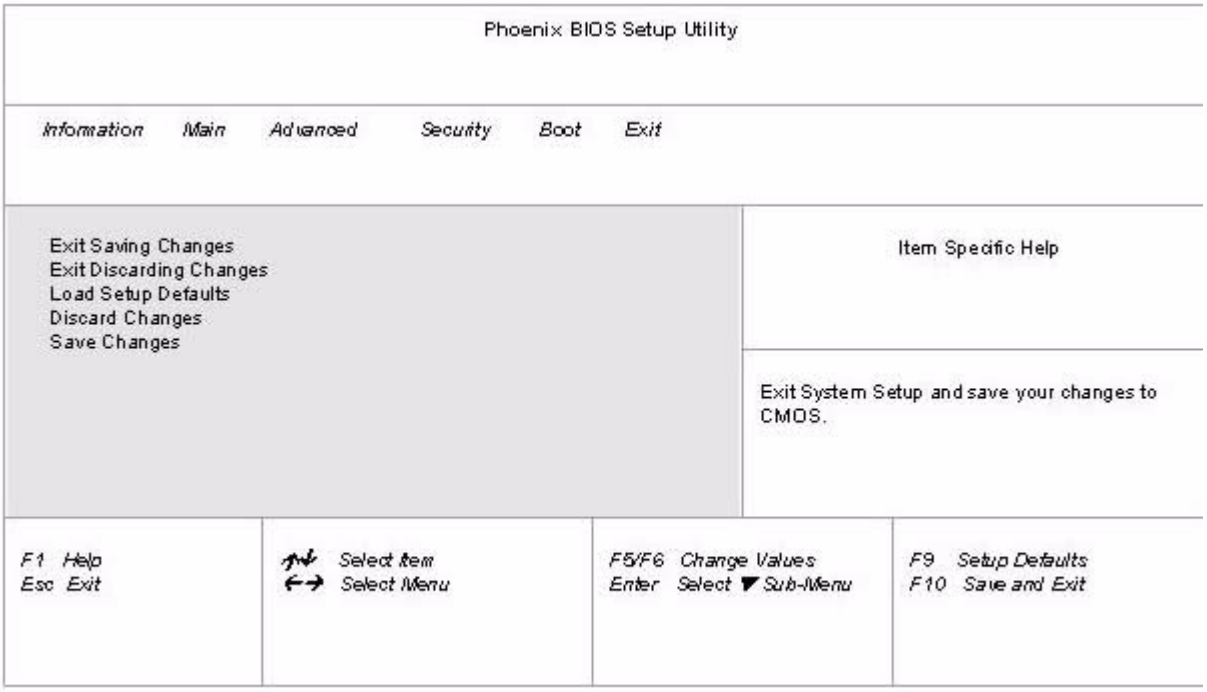
Help: Keys used to view or configure devices:

<ENTER> expands or collapses devices with a + or -

<F5> and <F6> moves the device up and or down.

Exit Setup

This menu contains exit options.



The following table describes the parameters in this screen. Setting in **boldface** are the defaults and suggested parameter settings.

Parameter	Description
Exit Saving Changes	Save any changes, and exit BIOS setup. *Help:* Exit System Setup and save your changes to CMOS.
Exit Discarding Changes	Discard any changes, and exit BIOS setup. *Help:* Exit utility without saving Setup data to CMOS.
Load Setup Defaults	Load Setup Defaults. *Help:* Load default values for all SETUP items.
Discard Changes	Discard any changes. *Help:* Load previous values from CMOS for all SETUP items.
Save Changes	Save changes. *Help:* Save Setup data to CMOS.

Machine Disassembly and Replacement

This chapter contains step-by-step procedures on how to disassemble the notebook computer for maintenance and troubleshooting.

To disassemble the computer, you need the following tools:

- Wrist grounding strap and conductive mat for preventing electrostatic discharge
- Flat screwdriver
- Plastic flat tip tweezers
- Phillips screwdriver
- Hex screwdriver
- Plastic flat screwdriver
- Plastic tweezers

NOTE: The screws for the different components vary in size. During the disassembly process, group the screws with the corresponding components to avoid mismatch when putting back the components.

NOTE: The images are not yet available at this time, once it will be ready this service guide will be revised accordingly.

General Information

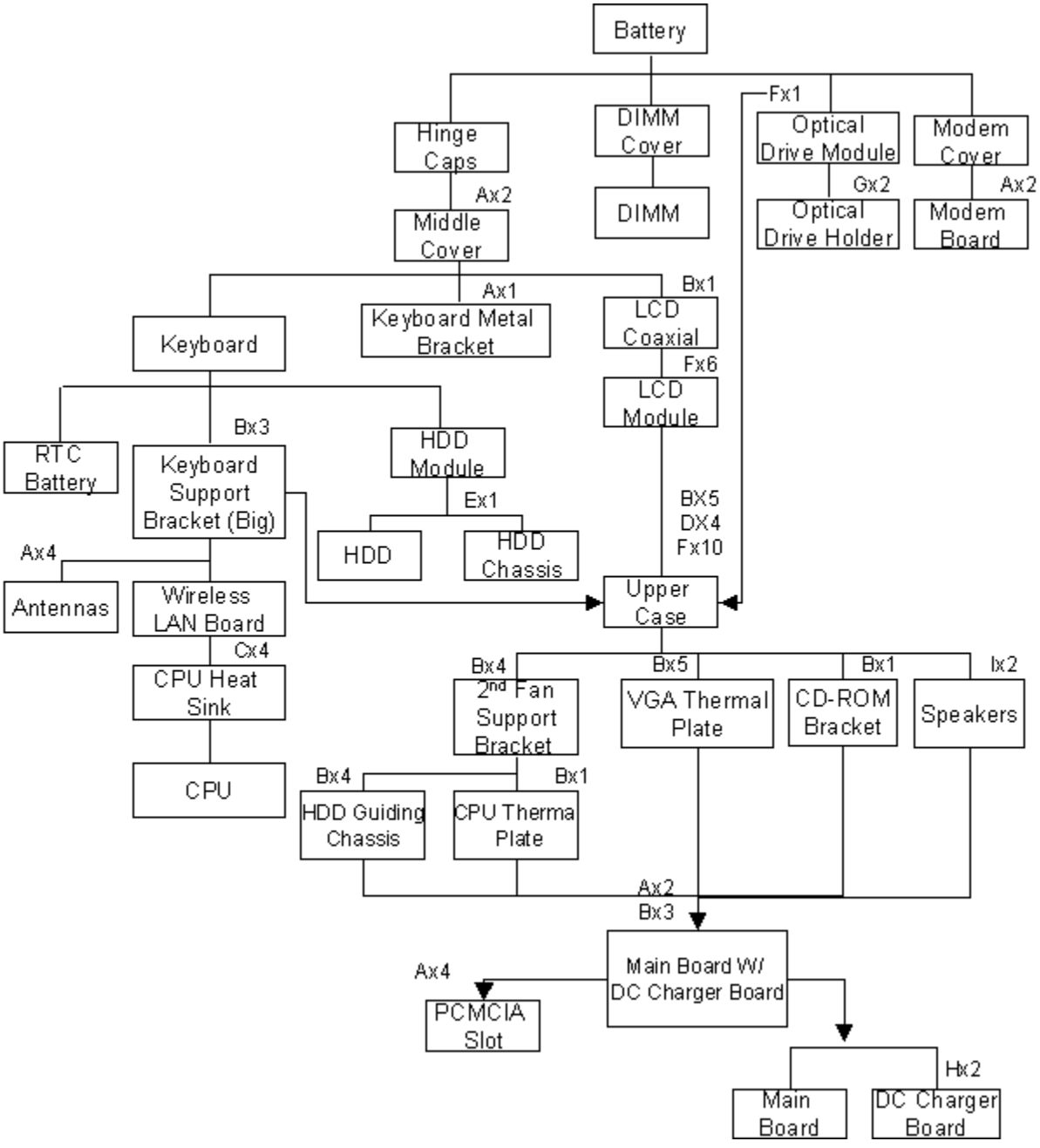
Before You Begin

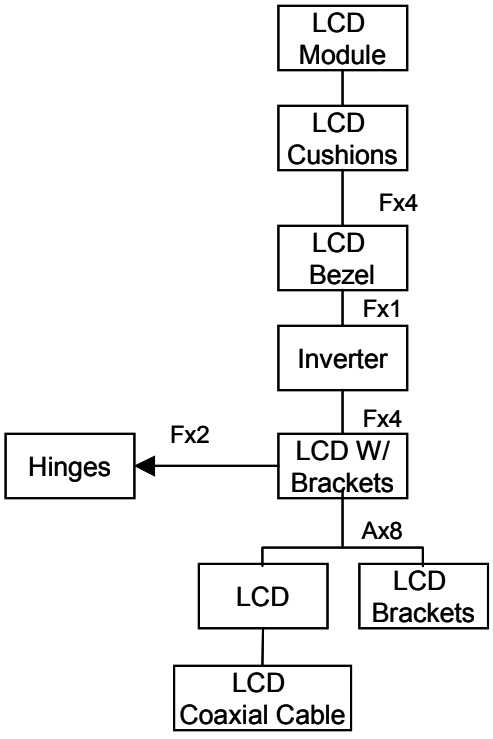
Before proceeding with the disassembly procedure, make sure that you do the following:

1. Turn off the power to the system and all peripherals.
2. Unplug the AC adapter and all power and signal cables from the system.
3. Remove the battery pack.

Disassembly Procedure Flowchart

The flowchart on the succeeding page gives you a graphic representation on the entire disassembly sequence and instructs you on the components that need to be removed during servicing. For example, if you want to remove the main board, you must first remove the keyboard, then disassemble the inside assembly frame in that order.





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Screw List

Item	Description
A	SCREW M2XL3 (BLACK)
B	SCREW M2XL4 (BLACK)
C	SCREW M2.5XL4 (SILVER)
D	SCREW M2.5XL3 (SILVER)
E	SCREW M3XL4 (SILVER)
F	SCREW M2.5XL8 (BLACK)
G	SCREW M3XL4 (BLACK)
H	SCREW M2xL4 (BLACK)
I	SCREW M2XL4 (SILVER)

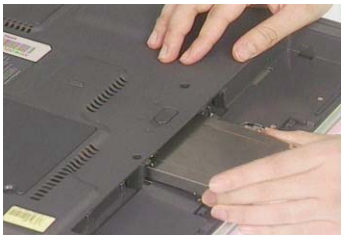
Removing the Battery

1. Push the battery release button in the arrow direction and push the battery outward from the main unit.

2. Remove the battery from the system.

Removing the Hard Diskette Drive Module

1. See “Removing the Battery” on page 55
2. Pull the plastic tag to detach the HDD module as shown.



Disassembling the Hard Diskette Drive Module

1. See “Removing the Battery” on page 55
2. See “Removing the Hard Diskette Drive Module” on page 56
3. Remove the one screw as shown here, and then detach the HDD from the HDD bracket.

Removing the External DIMM Module

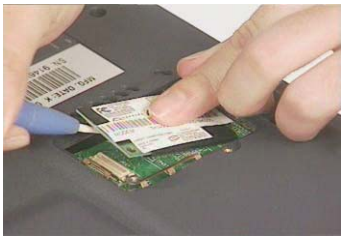
1. See “Removing the Battery” on page 55
2. Remove the two screws on the DIMM cover, then remove the DIMM cover from the lower case.

3. Push out the latches on both sides of the DIMM socket and then remove the DIMM module.

Removing the Modem Board

1. See “Removing the Battery” on page 55
2. Remove the one screw and then lift up the modem cover.

3. Remove the two screws, and detach the modem board from the main board by using a plastic flat screwdriver.



4. Disconnect the modem cable from the main board and remove the modem board away.

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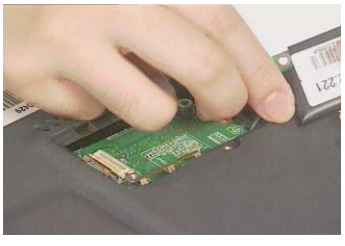


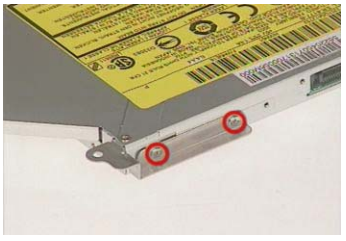
Removing the Optical Drive Module

1. See “Removing the Battery” on page 55
2. Remove the one screw, use plastic flat tip tweezers to push the optical drive module out in the direction as shown.

3. Gently detach the optical drive module out from the main unit .

Disassembling the Optical Drive Module

1. See “Removing the Battery” on page 55
2. Remove the two screws and then detach the optical drive holder from the optical drive.



Disassembling the Main Unit

Removing the Hinge Caps

1. See “Removing the Battery” on page 55
2. Adjust the LCD module to 45 degrees as shown.

3. Use a plastic flat screwdrier to help detach the hinge caps and remove them from the main unit.

Removing the Middle Cover

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. Remove the two screws , push the middle cover and release the latches as demonstrated, and then lift it up gently.

4. Turn the middle over and put it on the keyboard. Disconnect the launch board cable from the middle cover.

5. Remove the middle cover from the main unit.

Removing the Keyboard Metal Bracket

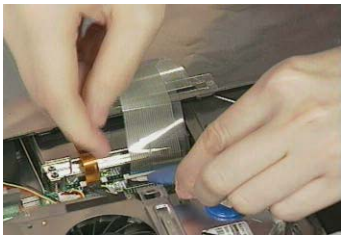
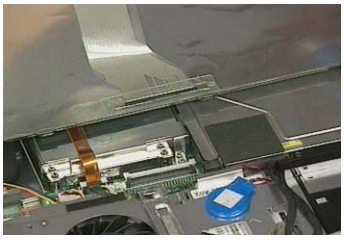
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. Remove the one screw and detach the small keyboard support bracket.

Removing the Keyboard

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61

5. Lift the keyboard up and put it on the upper case.

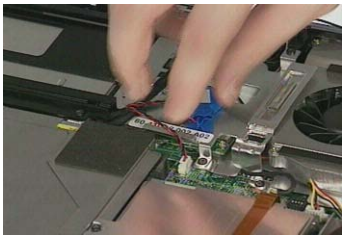
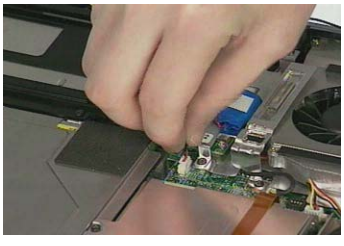
6. Disconnect the keyboard cable from the main board by using tweezers.

7. Remove the keyboard away.

Removing the RTC Battery

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. Detach the RTC battery and disconnect the RTC cable from the mainboard.

NOTE: Please make sure that you install the RTC battery immediately soon after you uninstall it to prevent the CMOS from resetting. While you install the RTC battery back, route the RTC cable as shown.

Removing the Antennas

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. Disconnect the two RF cables from the sockets on the wireless LAN board.

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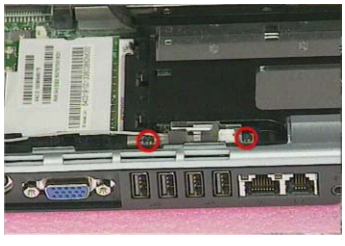
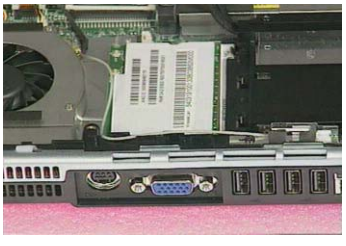
7. Remove the two screws and detach the left antenna.

8. Remove the two screws and detach the right antenna.



NOTE: 1. When attaching the antennas back to the upper case, make sure the two RF cables are routed as shown.



NOTE: Please ignore this step if your notebook is not equipped with antennas.

Removing the Big Keyboard Support Bracket

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. Put the RTC battery aside.

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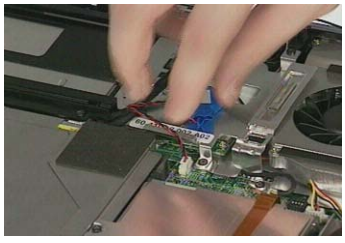
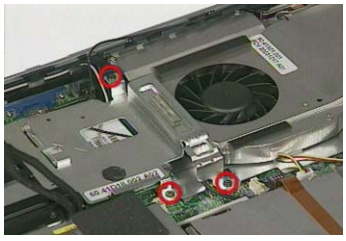
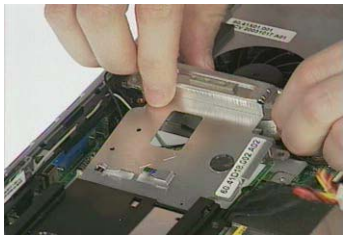


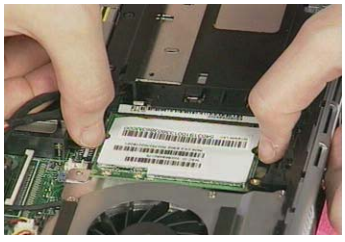
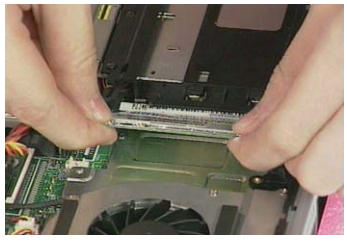
7. Remove the three screws and then detach the big keyboard support bracket from the main unit.





Removing the Wireless LAN Board

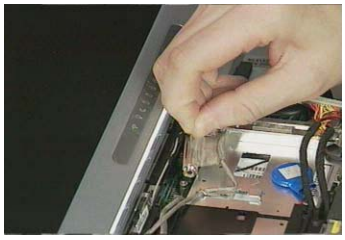
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. Press the latches on both sides of the socket, and then detach the wireless LAN board.

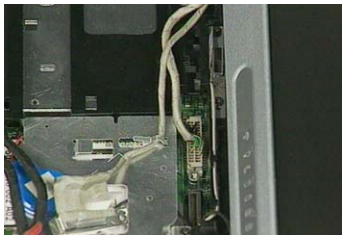
NOTE: Please ignore this step if your notebook is not equipped with wireless LAN board.

Removing the LCD Module

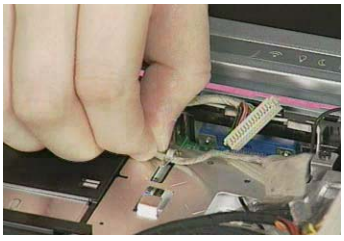
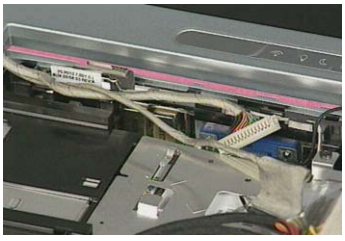
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. Remove the one screw and disconnect the coaxial cable from the main board.



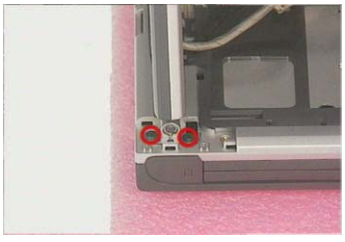
5. .Disconnect the inverter cable from the main board.



6. Then release the LCD coaxial cable

7. Remove the four screws as shown.



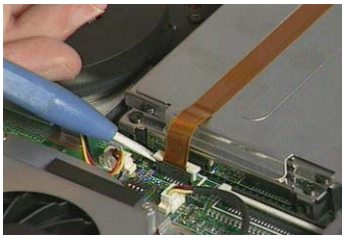
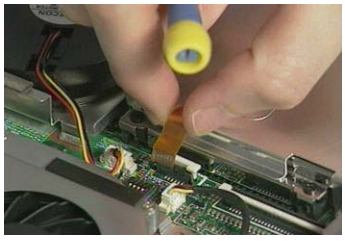
8. Remove the two screws from the bottom of the unit.

9. Lift up and detach the LCD module.

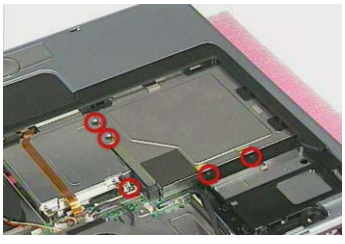
NOTE: When connecting the inverter cable and coaxial cable back to the unit, please note that the two cables should be routed as shown.

Separating the Upper Case from the Lower Case

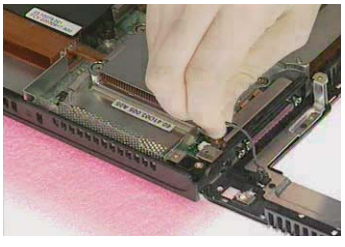
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. See “Removing the LCD Module” on page 65
8. Disconnect the touch pad cable by using plastic tweezers.

9. Release the fourteen screws from the bottom of the main unit, and the other 5 screws as shown.

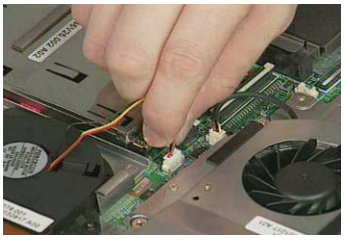
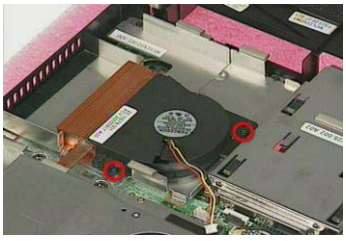
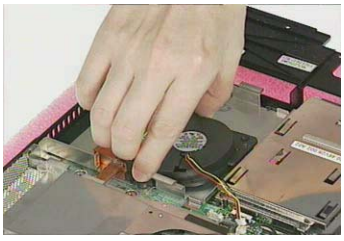


10. Detach the upper case from the main board and flip it over gently. Disconnect the cover switch cable from the main board. Then remove the upper case.

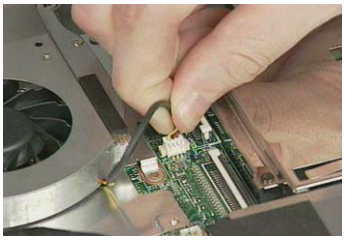
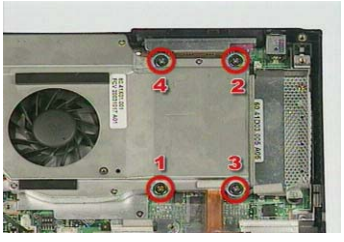


Removing the CPU Heat Sink

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. Disconnect the 2nd fan cable from the main board, remove the two screws as shown, and then remove the 2nd fan from the main board.

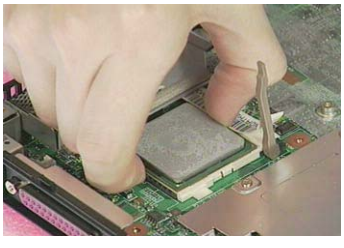
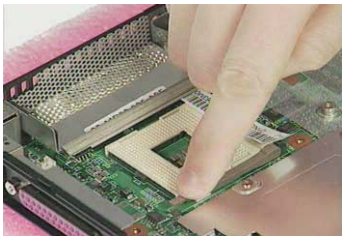
7. Disconnect the fan cable from the main board, remove the four screws on the CPU heat sink, and then remove the CPU heat sink from the main board.

NOTE: Please follow the order while securing the CPU heat sink with the four screws.

Removing the CPU

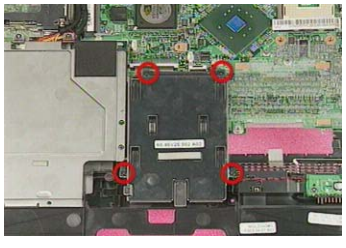
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the CPU Heat Sink” on page 67
7. Lift up the CPU lever to release the CPU socket, and then remove the CPU very carefully. Put the CPU lever back to its original position and have it locked well.

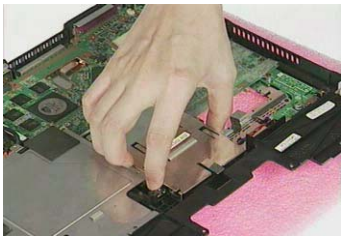



NOTE: To install the CPU, please put it back with the triangle mark this side as shown here.

Removing the HDD Guiding Chassis

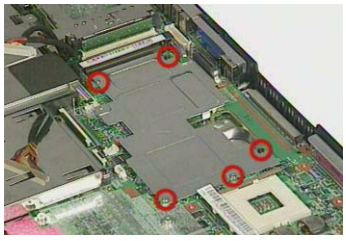
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. See “Removing the LCD Module” on page 65
8. See “Separating the Upper Case from the Lower Case” on page 67
9. Remove the four screws and detach the HDD guiding chassis from the main board.

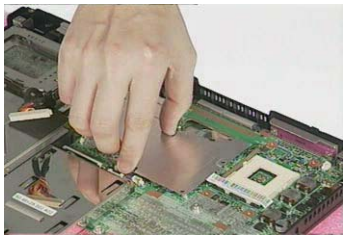




Removing the VGA Thermal Plate

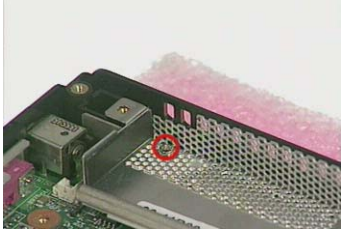
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. See “Removing the LCD Module” on page 65
8. See “Separating the Upper Case from the Lower Case” on page 67
9. Remove the five screws and detach the VGA Thermal Plate from the main board.

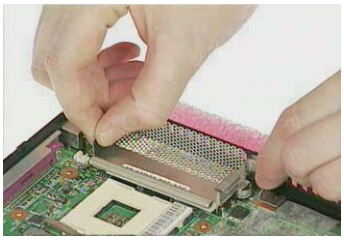




Removing the CPU Thermal Plate

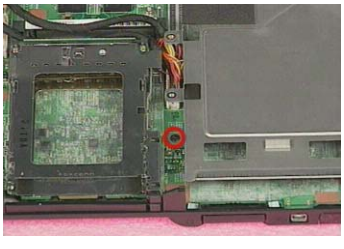
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. See “Removing the LCD Module” on page 65
8. See “Separating the Upper Case from the Lower Case” on page 67
9. Remove the one screw and detach the CPU thermal plate from the main unit.

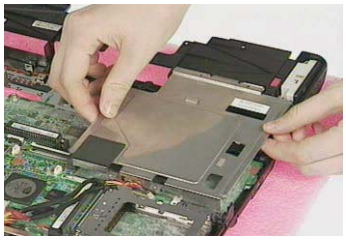




Removing the CD-ROM Bracket

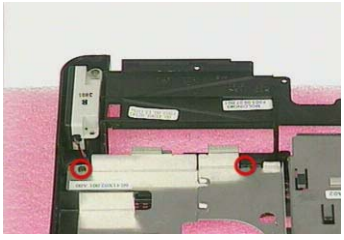
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. See “Removing the LCD Module” on page 65
8. See “Separating the Upper Case from the Lower Case” on page 67
9. Remove the one screw and detach the CD-ROM bracket from the main unit.

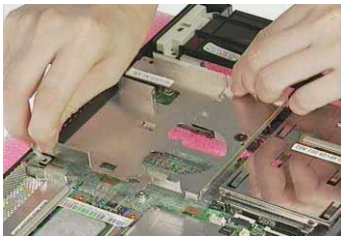




Removing the 2nd Fan Support Bracket

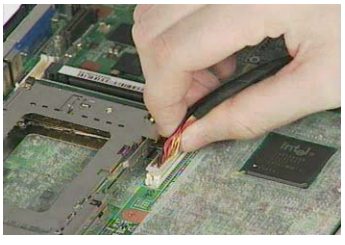
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. See “Removing the LCD Module” on page 65
8. See “Separating the Upper Case from the Lower Case” on page 67
9. See “Removing the 2nd Fan Support Bracket” on page 71
10. See “Removing the CPU Heat Sink” on page 67
11. Remove the two screw as shown, then remove the 2nd fan support bracket from the main board.





Removing the Launch Board Cable

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. See “Removing the LCD Module” on page 65
8. See “Separating the Upper Case from the Lower Case” on page 67
9. See “Removing the CD-ROM Bracket” on page 70
10. Disconnect the launch board cable from the main board.

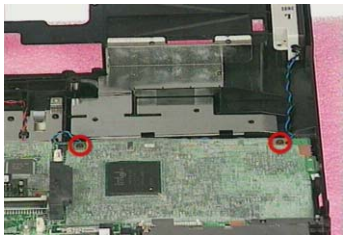
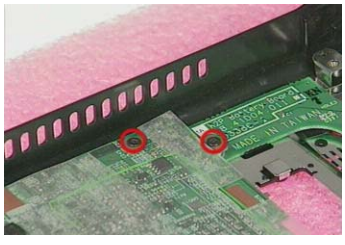


Removing the Main Board

1. See “Removing the Battery” on page 55
2. See “Disassembling the Optical Drive Module” on page 59
3. See “Removing the Hinge Caps” on page 60

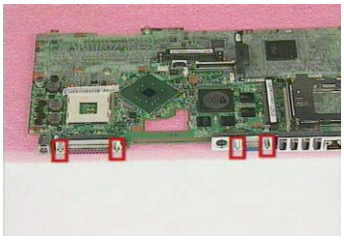
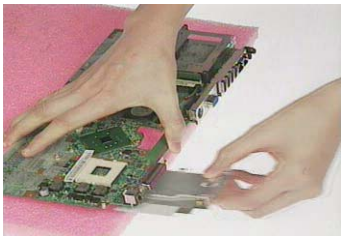
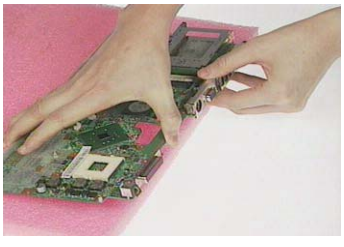
4. See “Removing the Middle Cover” on page 60
5. See “Removing the Keyboard Metal Bracket” on page 61
6. See “Removing the Keyboard” on page 61
7. See “Removing the Antennas” on page 62
8. See “Removing the LCD Module” on page 65
9. See “Separating the Upper Case from the Lower Case” on page 67
10. See “Removing the HDD Guiding Chassis” on page 69
11. See “Removing the VGA Thermal Plate” on page 69
12. See “Removing the CPU Thermal Plate” on page 70
13. See “Removing the CD-ROM Bracket” on page 70
14. Remove the MMC dummy card from the main unit.

15. Remove the four screws and detach the main board together from the lower case very carefully.

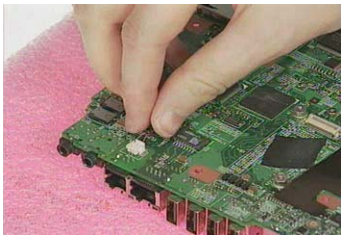



NOTE: While installing the main board to the lower case, pay attention to the IEEE 1394 port, make sure it’s installed well.

16. Remove the four hex screws as shown, then detach the I/O port brackets from the main board very carefully.

17. Disconnect the modem cable from the main board.



Removing the Cover Switch Cable

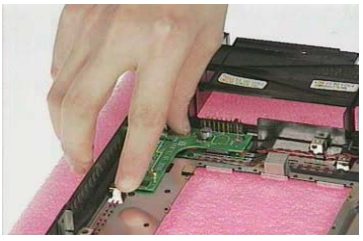
1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the Keyboard Metal Bracket” on page 61
5. See “Removing the Keyboard” on page 61
6. See “Removing the Antennas” on page 62
7. See “Removing the LCD Module” on page 65
8. See “Separating the Upper Case from the Lower Case” on page 67
9. Remove the cover switch cable from the upper case. Be very careful when you try to remove it from the upper case.

.

Removing the DC Charger Board

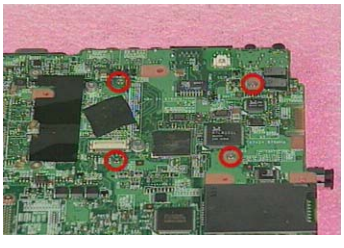
1. See “Removing the Battery” on page 55
2. See “Disassembling the Optical Drive Module” on page 59
3. See “Removing the Hinge Caps” on page 60
4. See “Removing the Middle Cover” on page 60
5. See “Removing the Keyboard Metal Bracket” on page 61
6. See “Removing the Keyboard” on page 61
7. See “Removing the Antennas” on page 62
8. See “Removing the LCD Module” on page 65
9. See “Separating the Upper Case from the Lower Case” on page 67
10. See “Removing the HDD Guiding Chassis” on page 69
11. See “Removing the VGA Thermal Plate” on page 69
12. See “Removing the CPU Thermal Plate” on page 70
13. See “Removing the CD-ROM Bracket” on page 70
14. See “Removing the 2nd Fan Support Bracket” on page 71

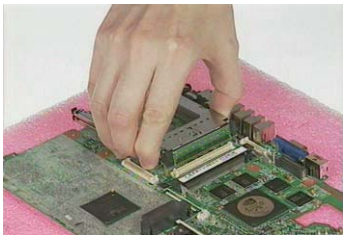
15. Remove the two screws, and detach the DC charger board from the lower case.



Removing the PCMCIA Slot

1. See “Removing the Battery” on page 55
2. See “Disassembling the Optical Drive Module” on page 59
3. See “Removing the Hinge Caps” on page 60
4. See “Removing the Middle Cover” on page 60
5. See “Removing the Keyboard Metal Bracket” on page 61
6. See “Removing the Keyboard” on page 61
7. See “Removing the Antennas” on page 62
8. See “Removing the LCD Module” on page 65
9. See “Separating the Upper Case from the Lower Case” on page 67
10. See “Removing the HDD Guiding Chassis” on page 69
11. See “Removing the VGA Thermal Plate” on page 69
12. See “Removing the CPU Thermal Plate” on page 70
13. See “Removing the CD-ROM Bracket” on page 70
14. See “Removing the 2nd Fan Support Bracket” on page 71
15. Release the four screws with a screwdriver and detach the PCMCIA slot from the main board.





Disassembling the LCD Module

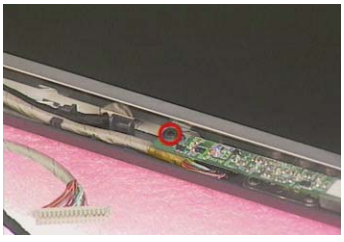
Removing the LCD Bezel

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the LCD Module” on page 65
5. Remove the four screw rubbers and then the four screws from the LCD module.

6. Snap off the LCD bezel carefully and then remove it from the LCD module.

Removing the Inverter Board

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the LCD Module” on page 65
5. See “Removing the LCD Bezel” on page 75
6. Remove the one screw, detach the inverter board from the LCD panel, disconnect the LCD power cable and the inverter cable from the inverter board.

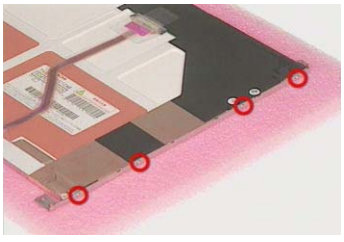
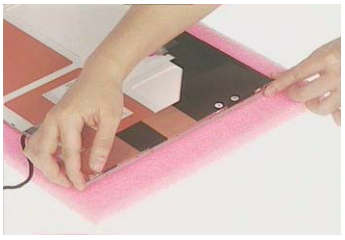
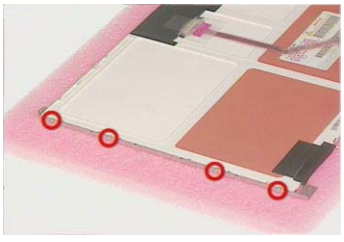


Removing the LCD

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the LCD Module” on page 65
5. See “Removing the LCD Bezel” on page 75
6. See “Removing the Inverter Board” on page 76
7. Remove the four screws on the hinges as shown.

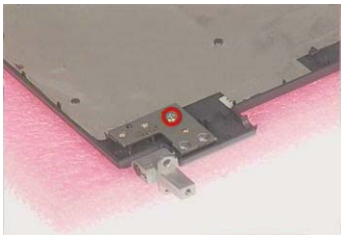
8. Detach the LCD together with the LCD brackets from the LCD panel.

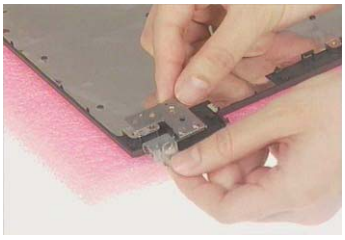
9. Remove the eight screws and then detach the LCD brackets from the LCD.

Removing the LCD Hinges

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the LCD Module” on page 65
5. See “Removing the LCD Bezel” on page 75
6. See “Removing the Inverter Board” on page 76
7. See “Removing the LCD” on page 76
8. Remove the two screws and detach the two hinges from the LCD panel.





Removing the LCD Coaxial Cable

1. See “Removing the Battery” on page 55
2. See “Removing the Hinge Caps” on page 60
3. See “Removing the Middle Cover” on page 60
4. See “Removing the LCD Module” on page 65
5. See “Removing the LCD Bezel” on page 75
6. See “Removing the Inverter Board” on page 76
7. See “Removing the LCD” on page 76
8. Remove the tapes, disconnect and remove the coaxial cable from the LCD.

Troubleshooting

Use the following procedure as a guide for computer problems.

NOTE: The diagnostic tests are intended to test only our company's products. Other brand's products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.
3. Use the following table with the verified symptom to determine which page to go to.

Symptoms (Verified)	Go To
POST does not complete. No beep or error codes are indicated.	"Power-On Self-Test (POST) Error Message" on page 83 "Undetermined Problems" on page 89
POST detects an error and displayed messages on screen.	"Index of Error Messages" on page 83
Other symptoms (i.e. LCD display problems or others).	"Power-On Self-Test (POST) Error Message" on page 83
Symptoms cannot be re-created (intermittent problems).	Use the customer-reported symptoms and go to "Power-On Self-Test (POST) Error Message" on page 83 "Intermittent Problems" on page 89 "Undetermined Problems" on page 89

Phoenix BIOS Error Code Messages

The following are the list of messages that Phoenix BIOs can display. Most of them occur during POST. Some of them display information about a hardware device, e.g., and the amount of memory installed. Others may indicate a porblem with a device, such as the way it has been configured. The following lists the explanation of the messages and remedies for reported problems.

NOTE: If your system displays one of the messages marked below with an asterisk (*), write down the message and contact your dealer. If your system change after you make changes in the Setup menus, reset the computer, enter Setup and install Seup defaults or correct the error.

Error Codes	Error Messages	Corrective Action
0200	Failure Fixed Disk	Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.
0210	Stuck key	Stuck key on keyboard
0211	Keyboard Error	Keyboard is not working
0212	*Keyboard Controller Failed	Keyboard controller failed test. May require replacing keyboard controller.
0213	Keyboard Locked - Unlock Key Switch	Unlock the system to proceed
0220	Monitor type does not match CMOS - Run Setup	Monitor type not correctly identified on Setup
*0230	Shadow RAM failed at offset: nnnn	Shadow RAM failed at offset nnnn of in the 64k block at which the error was detected.
*0231	System RAM failed at offset: nnnn	System RAM failed at offset nnnn of in the 64k block at which the error was detected.
*0232	Extended RAM failed at offset: nnnn	Extended memory not working or not configured properly at offset nnnn.
0250	System battery is dead - Replace and run SETUP	The CMOs clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.
0251	System CMOS checksum bd - Default configuration used	System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS default installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.
*0260	System Time Error	The timer test failed. Requires repair of system board
*0270	Real Time Clock Error	Real-Time Clock fail BIOS hardware test. May require board repair.
0271	Check date and time settings	BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991 - 2099)
0280	Previous Boot Incomplete - Default Configuration used	Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait-states,** improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the wait state configuration is correct. This error is cleared the next time the system is booted.
0281	Memory Size found by POST differed from CMOS	Memory size found by POST differed from CMOS

Error Codes	Error Messages	Corrective Action
02B0	Diskette Drive A Error	Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.
02B1	Diskette Drive B Error	
02B2	Incorrect Drive A type - run SETUP	Type of floppy drive A: Not correctly identified in Setup.
02B3	Incorrect Drive B Type - run SETUP	Type of floppy Drive B: not correctly identified in Setup.
02D0	System cache error - Cache disabled	RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.
02F0	CPU ID:	CPU socket number for Multi-Purpose error.
*02F7	Fail-Safe Timer NMI Failed	ServerBIOS2 test error: Fail-Safe timer takes too long.
	device Address Conflict	Address conflict for specified *device*
	Allocation Error for: *device*	Run ISA or EISA Configuration Utility to resolve resource conflict for the specified *device.*
	CD ROM Drive CD ROM Drive identified	CD ROM Drive CD ROM Drive identified
	Entering Setup Starting Setup program	Entering Setup Starting Setup program
	*Failing Bits: *nnnn*	The hex number *nnnn* is a map of the bits at the RAM address which failed the memory test. Each one (1) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset of the failure in System, Extended, os Shadow memory.
	Fixed Disk *n* Fixed disk *n (0-3)* identified.	Fixed Disk *n* Fixed disk *n (0-3)* identified.
	Invalid System Configuration Data	Problem with NVRAM (CMOS) data.
	I/O device IRQ Conflict	I/O device IRQ conflict error
	nnnn KB Extended RAM Passed Where *nnnn* is the amount of RAM in kilobytes successfully tested.	nnnn KB Extended RAM Passed Where *nnnn* is the amount of RAM in kilobytes successfully tested.
	nnnn Cache SRAM Passed *Where nnnn* is the amount of shadow RAM in kilobytes successfully tested.	*nnnn* Cache SRAM Passed *Where nnnn* is the amount of shadow RAM in kilobytes successfully tested.
	nnnn KB Shadow RAM Passed Where nnnn is the amount of shadow RAM in shadow in kilobytes successfully tested.	nnnn KB Shadow RAM Passed Where nnnn is the amount of shadow RAM in shadow in kilobytes successfully tested.
	nnnn KB system RAM Passed Where nnnn is the amount of shadow RAM in kilobytes successfully tested.	nnnn KB system RAM Passed Where nnnn is the amount of shadow RAM in kilobytes successfully tested.
	Operating System Not Found	Operating system cannot be located on either drive A.: or drive C: Enter Setup and see if fixed disk and drive A are properly identified.
	*Parity check 1 *nnnn*	Parity error found in the system bus. BIOS attempts to locate the address and its display. Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.
	Parity check 2 *nnnn*	Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot located the address, it displays *nnnn*.

Error Codes	Error Messages	Corrective Action
	Press <F2> to Setup, <F12> for Boot Menu	Press <F2> to Setup, for previous Displayed after any recoverable error message. Press <F12> to start the boot process or <F2> to Enter Setup and change the settings.
	Press <F2> to enter Setup	Optional message displayed during POST. Can be turned off in Setup.
	Run the I2O Configuration Utility	One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility. (e.g. the SAC Utility)
	System BIOS Shadowed System BIOS copied to shadow RAM	System BIOS Shadowed System BIOS copied to shadow RAM
	UMB upper limit segment address: *nnnn* Displays the address nnnn of the upper limit of U**pper Memory Blocks,** Indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.	UMB upper limit segment address: *nnnn* Displays the address nnnn of the upper limit of U**pper Memory Blocks,** Indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.
	Video BIOS Shadowed Video BIOS successfully copied to shadow RAM	Video BIOS Shadowed Video BIOS successfully copied to shadow RAM

Power-On Self-Test (POST) Error Message

The POST error message index lists the error message and their possible causes. The most likely cause is listed first.

NOTE: Perform the FRU replacement or actions in the sequence shown in FRU/Action column, if the FRU replacement does not solve the problem, put the original part back in the computer. Do not replace a non-defective FRU.

This index can also help you determine the next possible FRU to be replaced when servicing a computer.

If the symptom is not listed, see “Undetermined Problems” on page 89.

The following lists the error messages that the BIOS displays on the screen and the error symptoms classified by function.

NOTE: Most of the error messages occur during POST. Some of them display information about a hardware device, e.g., the amount of memory installed. Others may indicate a problem with a device, such as the way it has been configured.

NOTE: If the system fails after you make changes in the BIOS Setup Utility menus, reset the computer, enter Setup and install Setup defaults or correct the error.

Index of Error Messages

Error Message List

Error Messages	FRU/Action in Sequence
Failure Fixed Disk	Reconnect hard disk drive connector. “Load Default Settings” in BIOS Setup Utility. Hard disk drive Main Board
Keyboard locked - Unlock key switch	Unlock external keyboard
Monitor type does not match CMOS - Run Setup	Run “Load Default Settings” in BIOS Setup Utility.
Shadow RAM Failed at offset: nnnn	BIOS ROM Main Board
System RAM Failed at offset: nnnn	DIMM Main Board
Extended RAM Failed at offset: nnnn	DIMM Main Board
System battery is dead - Replace and run Setup	Replace RTC battery and Run BIOS Setup Utility to reconfigure system time, then reboot system.
System CMOS checksum bad - Default configuration used	RTC battery Run BIOS Setup Utility to reconfigure system time, then reboot system.
System timer error	RTC battery Run BIOS Setup Utility to reconfigure system time, then reboot system. Main Board
Real time clock error	RTC battery Run BIOS Setup Utility to reconfigure system time, then reboot system. Main Board
Previous boot incomplete - Default configuration used	Run “Load Default Settings” in BIOS Setup Utility. RTC battery Main Board

Error Message List

Error Messages	FRU/Action in Sequence
Memory size found by POST differed from CMOS	Run “Load Default Settings” in BIOS Setup Utility. DIMM Main Board
Diskette drive A error	Check the drive is defined with the proper diskette type in BIOS Setup Utility
Incorrect Drive A type - run SETUP	Check the drive is defined with the proper diskette type in BIOS Setup Utility
System cache error - Cache disabled	Main Board
CPU ID:	Main Board
DMA Test Failed	DIMM Main Board
Software NMI Failed	DIMM Main Board
Fail-Safe Timer NMI Failed	DIMM Main Board
Device Address Conflict	Run “Load Default Settings” in BIOS Setup Utility. RTC battery Main Board
Allocation Error for device	Run “Load Default Settings” in BIOS Setup Utility. RTC battery Main Board
Failing Bits: nnnn	DIMM BIOS ROM Main Board
Fixed Disk n	None
Invalid System Configuration Data	BIOS ROM Main Board
I/O device IRQ conflict	Run “Load Default Settings” in BIOS Setup Utility. RTC battery Main Board
Operating system not found	Enter Setup and see if fixed disk and drive A: are properly identified. Diskette drive Hard disk drive Main Board

Index of Symptom-to-FRU Error Message

Error Message List

No beep Error Messages	FRU/Action in Sequence
No beep, power-on indicator turns off and LCD is blank.	Power source (battery pack and power adapter). Ensure every connector is connected tightly and correctly. Reconnect the DIMM. LED board. Main Board.
No beep, power-on indicator turns on and LCD is blank.	Power source (battery pack and power adapter). Reconnect the LCD connector Hard disk drive LCD inverter ID LCD cable LCD Inverter LCD Main Board
No beep, power-on indicator turns on and LCD is blank. But you can see POST on an external CRT.	Reconnect the LCD connectors. LCD inverter ID LCD cable LCD inverter LCD Main Board
No beep, power-on indicator turns on and a blinking cursor shown on LCD during POST.	Ensure every connector is connected tightly and correctly. Main Board
No beep during POST but system runs correctly.	Speaker Main Board

LCD-Related Symptoms

Symptom / Error	Action in Sequence
LCD backlight doesn't work LCD is too dark LCD brightness cannot be adjusted LCD contrast cannot be adjusted	Enter BIOS Utility to execute “Load Setup Default Settings”, then reboot system. Reconnect the LCD connectors. Keyboard (if contrast and brightness function key doesn't work). LCD inverter ID LCD cable LCD inverter LCD Main Board
Unreadable LCD screen Missing pels in characters Abnormal screen Wrong color displayed	Reconnect the LCD connector LCD inverter ID LCD cable LCD inverter LCD Main Board
LCD has extra horizontal or vertical lines displayed.	LCD inverter ID LCD inverter LCD cable LCD Main Board

Indicator-Related Symptoms

Symptom / Error	Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly	Reconnect the inverter board Inverter board Main Board

Power-Related Symptoms

Symptom / Error	Action in Sequence
Power shuts down during operation	Power source (battery pack and power adapter). Battery pack Power adapter Hard drive & battery connection board Main Board
The system doesn't power-on.	Power source (battery pack and power adapter). Battery pack Power adapter Hard drive & battery connection board Main Board
The system doesn't power-off.	Power source (battery pack and power adapter). Hold and press the power switch for more than 4 seconds. Main Board
Battery can't be charged	Battery pack Main Board

PCMCIA Symptoms

Symptom / Error	Action in Sequence
System cannot detect the PC Card (PCMCIA)	PCMCIA slot assembly Main Board
PCMCIA slot pin is damaged.	PCMCIA slot assembly

Memory-Related Symptoms

Symptom / Error	Action in Sequence
Memory count (size) appears different from actual size.	Enter BIOS Setup Utility to execute "Load Default Settings, then reboot system. DIMM Main Board

Speaker-Related Symptoms

Symptom / Error	Action in Sequence
In Windows, multimedia programs, no sound comes from the computer.	Audio driver Speaker Main Board
Internal speakers make noise or emit no sound.	Speaker Main Board

Power Management-Related Symptoms

Symptom / Error	Action in Sequence
The system will not enter hibernation	Keyboard (if control is from the keyboard) Hard disk drive Main Board

Power Management-Related Symptoms

Symptom / Error	Action in Sequence
The system doesn't enter hibernation mode and four short beeps every minute.	Press Fn+F2 and see if the computer enters hibernation mode. Touchpad Keyboard Hard disk connection board Hard disk drive Main Board
The system doesn’t enter standby mode after closing the LCD	LCD cover switch Main Board
The system doesn't resume from hibernation mode.	Hard disk connection board Hard disk drive Main Board
The system doesn't resume from standby mode after opening the LCD.	LCD cover switch Main Board
Battery fuel gauge in Windows doesn’t go higher than 90%.	Remove battery pack and let it cool for 2 hours. Refresh battery (continue use battery until power off, then charge battery). Battery pack Main Board

Peripheral-Related Symptoms

Symptom / Error	Action in Sequence
System configuration does not match the installed devices.	Enter BIOS Setup Utility to execute “Load Default Settings”, then reboot system. Reconnect hard disk/CD-ROM/diskette drives.
External display does not work correctly.	Press Fn+F3, LCD/CRT/Both display switching Main Board
USB does not work correctly	Main Board
Print problems.	Ensure the “Parallel Port” in the “Onboard Devices Configuration” of BIOS Setup Utility is set to Enabled. Onboard Devices Configuration Run printer self-test. Printer driver Printer cable Printer Main Board
Serial or parallel port device problems.	Ensure the “Serial Port” in the Devices Configuration” of BIOS Setup Utility is set to Enabled. Device driver Device cable Device Main Board

Keyboard/Touchpad-Related Symptoms

Symptom / Error	Action in Sequence
Keyboard (one or more keys) does not work.	Reconnect the keyboard cable. Keyboard Main Board

Keyboard/Touchpad-Related Symptoms

Symptom / Error	Action in Sequence
Touchpad does not work.	Reconnect touchpad cable. Touchpad board Main Board

Modem-Related Symptoms

Symptom / Error	Action in Sequence
Internal modem does not work correctly.	modem board Main Board

NOTE: If you cannot find a symptom or an error in this list and the problem remains, see “Undetermined Problems” on page 89.

LAN-Related Symptoms

Symptom / Error	Action in Sequence
Internal LAN does not work correctly.	LAN board Main Board

Wireless LAN-Related Symptoms

Symptom / Error	Action in Sequence
Internal wireless LAN does not work correctly.	right or left antenna kits wireless LAN board Main Board

Intermittent Problems

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists.

When analyzing an intermittent problem, do the following:

1. Run the advanced diagnostic test for the main board in loop mode at least 10 times.
2. If no error is detected, do not replace any FRU.
3. If any error is detected, replace the FRU. Rerun the test to verify that there are no more errors.

Undetermined Problems

The diagnostic problems does not identify which adapter or device failed, which installed devices are incorrect, whether a short circuit is suspected, or whether the system is inoperative.

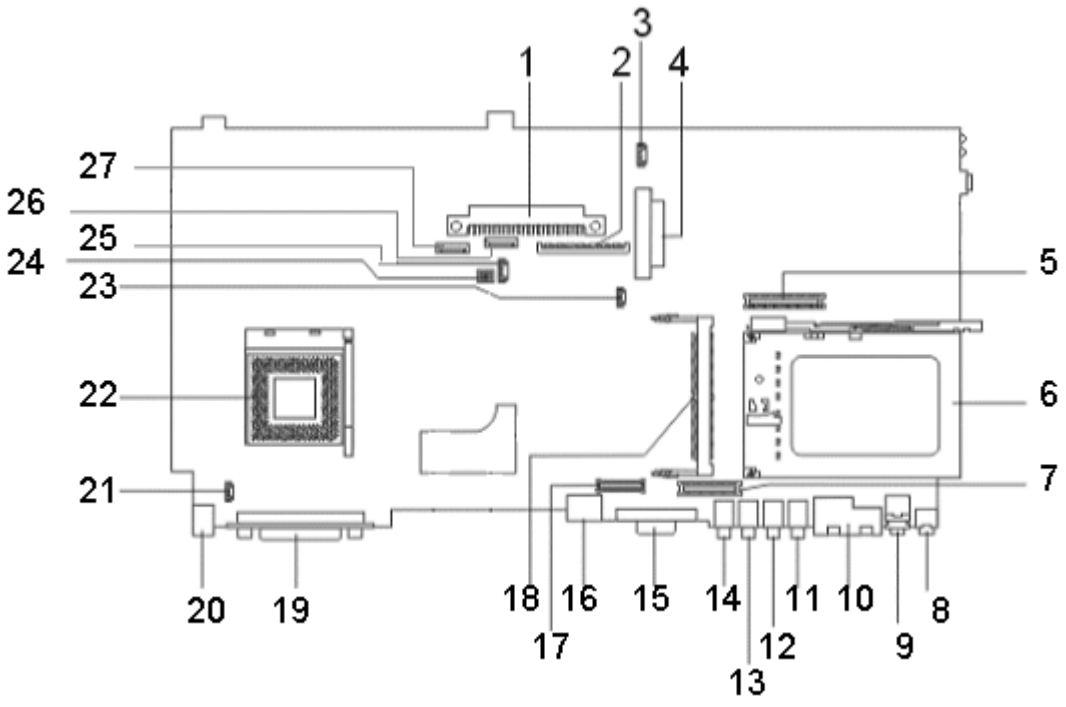
Follow these procedures to isolate the failing FRU (do not isolate non-defective FRU).

NOTE: Verify that all attached devices are supported by the computer.

1. Power-off the computer.
2. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
    - ❑ Other companies' devices
    - ❑ Printer, mouse, and other external devices
    - ❑ Battery pack
    - ❑ Hard disk drive
    - ❑ DIMM
    - ❑ CD-ROM/Floppy diskette drive Module
    - ❑ PC Cards
4. Power-on the computer.
5. Determine if the problem has changed.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRU one at a time. Do not replace a non-defective FRU:
    - ❑ Main Board
    - ❑ LCD assembly

Jumper and Connector Locations

Top View



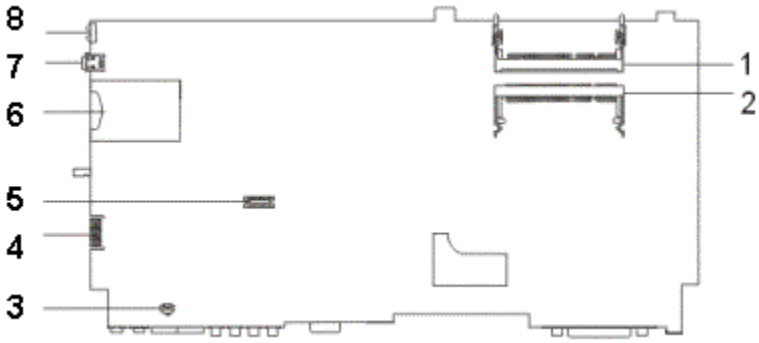
PCB 03217-1

1	HDD1	Hard Diskette Drive connector	15	CRT1	External monitor port
2	KB1	Keyboard connector	16	TV1	TV-out connector
3	SPK1	Speaker cable connector	17	LCD1	LCD coaxial cable connector
4	IDE1	Optical drive connector	18	MINI1	Mini-PCI connector
5	CN4	Launch board cable connector	19	PRT1	Parallel port
6	CN3	PCMCIA cardbus connector	20	DCIN1	AC adapter connector
7	INV1	Inverter cable connector	21	CN1	Lid cover switch cable connector
8	LIN1	Line-in connector	22	U15	CPU socket
9	LOUT1	Line-out connector	23	RTC1	RTC battery connector
10	RJ1	Modem port (right) Network port (left)	24	SW	SW1 Setting*
11	USB1	USB port	25	FAN1	CPU fan connector
12	USB2	USB port	26	TPAD1	touch pad cable connector
13	USB4	USB port	27	FAN2	Second CPU fan connector
14	USB3	USB port			

SW1 Settings

Jumper #	Function
Jumper 3, 6	Bypass user (power on) password
Jumper 4, 5	Boot Block
Jumper 1, 2	Reserved

Bottom View



1	DM2	Memory socket 2	5	MDC1	Modem connector
2	DM1	Memory socket 1	6	CN5	SD/MS/ MMC 3-in-1 slot
3	Ring1	Modem cable connector	7	JK1	1394 connector
4	CN2	Golden Finer (Debug Board)	8	IR1	FIR

FRU (Field Replaceable Unit) List

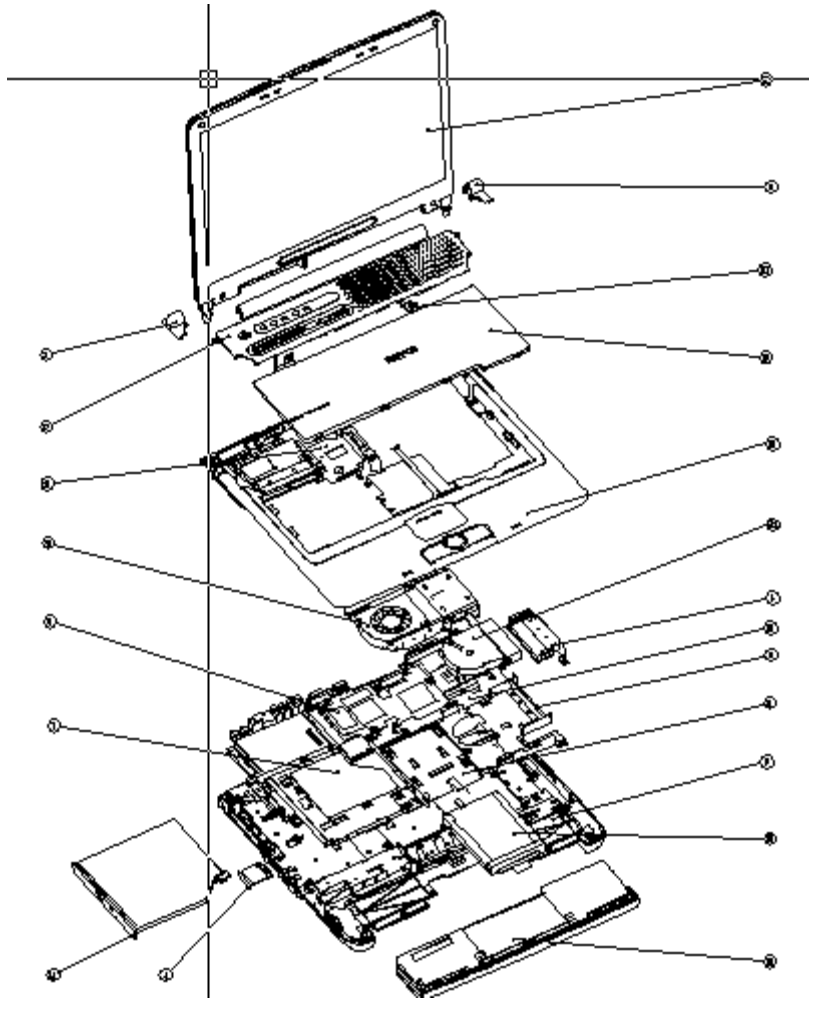
This chapter gives you the FRU (Field Replaceable Unit) listing in global configurations of the product. Refer to this chapter whenever ordering for parts to repair or for RMA (Return Merchandise Authorization).

IMPORTANT: Please note WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel. For whatever reasons a part number change is made, it will not be noted in the printed Service Guide. For AUTHORIZED SERVICE PROVIDERS, your office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the local FRU list provided by your regional office to order FRU parts for repair and service of customer machines.

NOTE: To scrap or to return the defective parts, you should follow the local government ordinance or regulations on how best to dispose it, or follow the rules set by your regional office on how to return it.

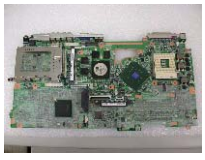
NOTE: The number indicates the location shown on exploded diagram or “NS” indicates “Not shown” on it.

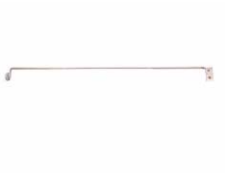
Exploded Diagram



Picture	No.	Partname	Description
Adapter			
	NS	ADAPTER 3PIN 20V 120W	ADPT 3P 20V 120W LISHIN
LCD			
	03	LCD 15" XGA AU B150XG01 V.2/XXXXX	LCD 15"XGA B150XG01 V.2/XXXXX
Battery			
	NS	RTC BATTERY	BATTERY RTC 100MM
	NS	BATTERY 12CELL 2.2AH SANYO W/O COVER	ASY BTY PK LI+2.2MAH 12C SANYO
Heat Sink			
	NS	CPU THERMAL PLATE	ASSY CPU THERMAL PLATE K2P
	NS	VGA THERMAL PLATE	ASSY VGA THERMAL PLATE K2P

Picture	No.	Partname	Description
	NS	CPU FANSINK W/FAN	ASSEMBLY CPU HEAT-PIPE K3U
	NS	FAN	2ND FAN K3U
Cables			
	NS	INVERTER CABLE	CABLE INVERTER
	NS	LCD COAXIAL CABLE	CABEL COAXIAL XGA FVC K3U
	NS	LAUNCH CABLE	CABLE LAUNCH 40P 2C 120MM
	NS	COVER SWITCH CABLE	C.A. 2P 2C 50MM SUSPEND SWITCH
DVD-ROM Drive			
	NS	DVD-ROM 8X MATSUSHITA SR-8177	DVD 8X MKE/SR-8177 K3 STD BZL

Picture	No.	Partname	Description
Main Board			
	NS	MAINBOARD K3U W/MODEM CABLE & LAUNCH BOARD CABLE & RTC BATTERY	K3D MB W/O CPU 02219-1
Boards			
	NS	TOUCHPAD BOARD	TOUCHPAD SYNAPTICS/TM41PDS357
	NS	MODEM BOARD ASKEY 1456VQL4A(INT)	MODEM MDC ASKEY 1456VQL4A(INT)
	NS	DC CHARGE BOARD	K2P DC-DC CHARGER BD-1
	NS	INVERTER BOARD	INVERTER 14"/15" T62I194.12
Case/Cover/Bracket Assembly			
	NS	LCD BRACKET 15” LEFT	BRACKET 15” LCD L K3D

Picture	No.	Partname	Description
	NS	LCD BRACKET 15” RIGHT	BRACKET 15” LCD R K3D
	NS	LCD PANEL	ASSEMBLY PANEL 15” K3D
	NS	HINGE PACK 15"	HINGE PACK 15"
	NS	LCD BEZEL W/NAME PLATE	ASSEMBLY BEZEL 15” K3D
	NS	CD-ROM SUPPORT BRACKET	ASSY CD-ROM SUPPORT K2P
	NS	HDD CHASSIS	ASSY CHASSIS HDD GUIDE
	NS	HDD BRACKET	ASSEMBLY HDD BRACKET K3D

Picture	No.	Partname	Description
	NS	OPTICAL BRACKET	BRACKET CD-ROM K3D
	NS	MIDDLE COVER	ASSEMBLY MIDDLE COVER K3U
	NS	KEYBOARD SUPPORT BIG	ASSEMBLY KB SUPPORT K3U
	NS	KEYBOARD SUPPORT SMALL	METAL FIX KB K3D
	NS	HINGE CAP RIGHT	CAP R HINGE K3D
	NS	HINGE CAP LEFT	CAP L HINGE K3D
	NS	LOWER CASE W/DIMM COVER & MODEM COVER & SPEAKER	ASSEMBLY L-CASE 1 K3D

Picture	No.	Partname	Description
	NS	MODEM DOOR	ASSEMBLY MDC DOOR K3U
	NS	DIMM DOOR	ASSEMBLY DIMM DOOR K3U
	NS	UPPER CASE W/COVER SWITCH CABLE	ASSEMBLY U-CASE K3U

Picture	No.	Partname	Description
Speakers			
	NS	SPEAKER	SPEAKER YUHINA
Miscellaneous			
	NS	SCREW RUBBER	RUBBER LCD CUSHION K3D
	NS	SCREW MYLAR	RUBBER LCD SCREW K3D
Screws			
	NS	SCREW	SCRW HEX NYL I#R-40/O#4-40 L5.5
	NS	SCREW	SCREW
	NS	SCREW	SCREW M2.5X6
	NS	SCREW	SCREW WAFER NYLOK NI 2ML3
	NS	SCREW	SCREW M2*4 WAFER NI
	NS	SCREW	SCREW M2.5*3 WAFER NI
	NS	SCREW	SCREW M2.5*4L NI
	NS	SCREW	SCREW M3X4(86.9A524.4R0)
	NS	SCREW	SCRW MAC FLAT M2.5*L4 NI NYLOK

Test Compatible Components

This computer's compatibility is tested and verified by the internal testing department. All of its system functions is tested under Windows XP.

Refer to the following lists for components, adapter cards, and peripherals which have passed these tests. Regarding configuration, combination and test procedures, please refer to the Openbook1849 Compatibility Test Report released by the Mobile System Testing Department.

Microsoft Windows XP Environment Test

Item	Specifications
Processor	Intel Pentium 4 3.2GHz
Memory (DDR-DIMM)	Samsung 256MB Samsung 512MB
LCD	15” TFT XGA (AU) 15” TFT SXGA+ (AU)
Hard Disk Drive	40GB (HT) 80GB (HT)
Basic PC Card List	
LAN Card	3Com EtherLink III 3C589D (PEN-050) IBM EtherJet CardBus Adapter 10/100 (PEN-936) Intel EtherExpress Pro/100 Mobile Adapter MBLA3200 (PEN-906~910) Xircom CardBus Ethernet 10/100 32Bit CBE-10/100BTX (PEN-906~912)
Modem Card	3Com Megahertz 56K Modem PC Card (PFM-044) Xircom CreditCard Modem 56 (PEN-079~081) IBM 56K Double Jack Modem 02K4197 (PFM-059-1~2)
Combo Card	3Com Megahertz 10/100 LAN + 56K Modem PC Card KB-04-002 (PCB-041) Xircom RealPort CardBus Ethernet 10/100 + Modem 56 RBEM5G-100 (PCB-053-054)
ATA Card	IBM MicroDrive 340MB PMR-02-03~04 PMR-036 IBM MicroDrive 1G PMR-051~052 Iomega Click! 40MB PMR 045 Sony Memory Stick 64 MB PMR-062 Sandisk Flash Card 20MB Apacer SD Flash Card 128MB CARD-05 Apacer 128MB Memory Stick PMR-065
USB 2.0 Card	Apricorn EZ-USB 2.0 CardBus PC Card (Pen-934) DTK USB 2.0 Port CardBus Host Controller PUC-102 (Usb-Cb-03 & Usb-Cb-02) Adaptec USB 2 Connect (USB-CB-01) IOGEAR CardBus Card USB 2.0 (USB-CB-05) (USB-CB-06)
1394 Card	Buffalo 1394 Interface CardBus IFC-ILCB/DV (IEEE-01~03) I-O Data 1394 Interface CardBus CB1394/DVC(IEEE-06~07) Pixela 1394 CardBus PC Card PIX-PCMC/FW1 (IEEE-04~05)
SCSI Card	Adaptec 1480A or B SCSI CB 1680880A/B (PIO-001~006) NewMedia Bus Toaster SCSI II (PIO-007~008)
Wireless LAN Card	Intel Pro/Wireless LAN PC Card 2011B (PEN-096) Proxim Skyline 802.11a Cardbus Card (PEN-937~938) Cisco Aironet 350 Series Wireless LAN Card (Wireless-011~012) NeWeb Wireless Lan Card 802.11b (Wireless 013~014) Cisco Wireless Lan Card 802.11a (Wireless- 015~016)
BlueTooth Card	IBM Community Bluetooth PC Card (Bule-04) Toshiba Bluetooth PC Card PABTC001 (Bule-02)
ISDN	US Robotics Megahertz 128K ISDN Card 405R17T7117M (PIS-002) IBM ISDN Card 05K3320 (PFM-058)
Token Ring Card	IBM Token ring 16/4 Adapter II (PTR-004~008)
I/O Peripheral	

Item	Specifications
I/O - External CRT	Acer 211c 21” MT-01~034 ViewSonic PF790, 19” MT-01-039 Acer FP751 17” TFT LCD MT-01-036 IBM Color TFT LCD 14” 9514-B03 (MT-01-028) Compaq Color Monitor V70 (MT-01-003) Net Color Monitor 20” MT (01-006) Mozo 17” TFT LCD (DVI) MT-01-30)
I/O - Projector	NEC MultiSync MT-1040
I/O - Legacy(PS2 / Serial) Keyboard / Mouse	IBM 101 Key Keyboard KB-454 (KB-01-013) IBM 109 Key Keyboard 5576-B06 (KB-01-017) Acer PS2 Keyboard 6311-C4C (KB-01-21~24) Acer KB-101A GQ87EEKB-101A (KB-01-004) IBM Numeria KeyPad III 79F6408 (KB-01-016) IBM Numeric KeyPad (KB-01-016) Acer Mouse M-S34 (MO-02-003) IBM PS2 Mini Mouse 07G0033 (MO-02-036) IBM PS2 Mouse 12J3615 (MO-02-037) Logitech Cordless MouseMan Wheel PS2 interface (MO-03-057~58) Logitech Serial Mouse M-M35 (MO-01-031) Microsoft InteliMouse PS2 interface (MO-02-022) Microsoft InteliMouse Optical PS2 interface (MO-03-056) Logitech First Mouse Three Button Serial Mouse (MO-01-031)
I/O - Parallel (Printer/Scanner)	Canon BJC-600J (JP OS only) PT-02-005 Epson Stylus Color 740 Parallel Interface PT-02-012 HP DeskJet 890C PT-01-004 HP DeskJet 880C Parallel interface PT-02-013 HP LaserJet 6MP PT-01-015 HP LaserJEt 2200 PT-02-014
I/O - IR Printer	HP LaserJet 6MP use IR PT-01-015 HP LaserJet 2200 use IR PT-02-014
I/O - USB Keyboard/Mouse	Chicony USB Keyboard KU-8933 (KB-04-001~002) Microsft Natural Keyboard Pro (KB-04-013) Acer Aspire USB Mouse M-UB48(MO-03-040) Logicool USB Mouse IOWCM-USB (MO-03-046~47) Logitech Coreless MouseMan Wheel USB interface (MO-03-058) Logitech USB Wheel Mouse M-BB48 (MO-03-050) Microsoft IntelliMouse Optical USB Interface (MO-03-056)
I/O - USB Printer/Scanner	Epson Stylus Color 740 USB interface PT-02-012 HP DeskJet 880C USB interface PT-02-013 Canon CanonScan D1250 (USB 2.0, JP OS only) (SC-009) HP ScanJet 3300C Color Scanner MY97712194 (SC-01-004) HP DeskJet 995C (USB interface) PT-03-016
I/O - USB Speaker/Joystick	JS USB Digital Speaker SP-01-017~18 Panasonic USB Speaker EAB-MPC57USB SP-01-023 AIWA Multimedia Digital Speaker SC-UC78 (SP-01-019) Microsoft Side Winder Precision Pro Joystick 326-00069 (JK-01-002) Logitech WingMan Rumble Pad G-UA3 (JK-01-010~11)
I/O - USB Camera	Intel Easy PC Camera A20953-001 (CM-01-022) Logitech QuickCam Express Internet (CM-01-019-2) Logitech QuickCam Home PC Video Camera VCAM-U1(CM-01-018-2) Orange Micro USB 2.0 Web Cam (CM-02-04)

Item	Specifications
I/O - USB Storage Drive	Logitec CDRW + DVDROM combo USB interface RW-12 Iomega USB Zip 250MB ZIP-01-002 Plextor Burn-Proof CDRW (USB 2.0) PX-S88TU CW-03) Fujitsu MO-1300 1.3G (USB 2.0) MO-003 Fujitsu 20G HDD (USB 2.0) T4988618913874 USB-HD-01 Sony DVDROM (USB 2.0) USB-RW-01 IO-Data DVDROM (USB 2.0) USB-RW-02 PQI 6 IN 1 Flash Card Reader/Writer USB-03-03 Sandisk Card Reader 6 IN 1 (USB 2.0) USB-03-04
I/O - USB Flash Drive	Apacer USB Handy Drive 32/128MB USB-03-004~008 Apacer USB Handy Drive 256/512MB USB-03-006~010 Sony Memory Key 128MB USB-03-006~010 Dell Memory key 64MB PMR-069~8
I/O - USB Hub	Belkin 4 Port USB Hub F5u001 HUB -02-015 Eizo I Station USB Hub DH-1401 HUB-02-012~13 Elecom USB Hub 4 Port UH-4S HUB-02-014 Sanwa USB Hub 4 Port HUB-010~011 4 Port Hub (usb 2.0) UH-204 HUB-02-02 Corega Wireless LAN USB Stick11 (USB 1.1) T498818913874 USB-HD-01
I/O - 1394 Storage Drive	Logitec Fireware CDRW + DVD-ROM Combo I-O Data Fireware HD I.LINK 30GB HAD-130G HD-01-005 VST-Fireware HD FW1260 HD-01-003 Maxtor External Storage 80GB 1394 HDD HD-01-009 Smartdick Firelite hard Devies for 1394 HD-01-010~11
I/O - 1394 Camera	Sony DV DCR-TRV10 CM-01-005 Orange Micro 1394 Web Cam(*1) CM-02-02~03
I/O - 1394 Hub	ADS PYRO 1394 HUB HUB-009
I/O - Access Point 802.11b	Hitachi DC-CN3300 RW-12 Lucent RG-1000 ZIP-01-002 Lucent WavePoint-II PX-S88TU CW-03 Cisco Aironet 350 Wireless-010 Orinoco AP-500 Wireless-001
I/O - TV (NTSC/PAL)	Sony 29” Trinitron KV-XA29N90
I/O - Bluetooth Device	Sony Ericsson Wireless headset BLUE-08 HP DeskJet 995C (Bluetooth interface) PT-03-016 X Bridge Bluetooth Access Point BT300 PT-03-016
I/O - Multimedia Card	Pretec Multimedia card 64MB PMR-055 Sandisk Multimedia card 32MB PMR-056~7
I/O - SD Card	Pretec SD card 64MB RW-12 Apacer SD card 128MB RW-12 Transcend SD card 32MB RW-12
I/O - Memory Stick	Sony Memory stick 64MB PMR-040~42 Sandisk memory stick 128MB PMR-059 Apacer memory stick 128MB PMR-065
I/O - Smart Media	Sandisk Smart media 128MB PMR-069 Apacer Smart media 64MB PMR-066

Online Support Information

This section describes online technical support services available to help you repair your AOpen Systems.

If you are a distributor, dealer, ASP or TPM, please refer your technical queries to your local AOpen branch office. AOpen Branch Offices and Regional Business Units may access our website. However, some information sources will require a user i.d. and password. These can be obtained directly from AOpen.

AOpen's Website offers you convenient and valuable support resources whenever you need them.

In the Technical Information section you can download information on all of AOpen's Notebook, Desktop and Server models including:

- Service guides for all models
- User's manuals
- Training materials
- Main manuals
- Bios updates
- Software utilities
- Schematics
- Spare parts lists
- Chips
- TABs (Technical Announcement Bulletin)

The service repair section provides you with downloadable information on:

- Troubleshooting guides
- Tooling box information
- Repair instructions for specific models
- Basic repair guidelines
- Debug cards for AOpen's latest models

For these purposes, we have included an Acrobat File to facilitate the problem-free downloading of our technical material.

Also contained on this website are:

- Returned material authorization procedures
- An overview of all the support services we offer, accompanied by a list of telephone, fax and email contacts for all your technical queries.

We are always looking for ways to optimize and improve our services, so if you have any suggestions or comments, please do not hesitate to communicate these to us.

For Further information, please access to AOpen’s website: http://www.AOpen.com/products/nb

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